

SIX MONTHS EXPERIENCE IN THORACIC SURGERY ABOARD USS REPOSE (AH16) PRESENTED BY:

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16 JULY 1966

I am very grateful to the REPOSE, it certainly has taught me a lot about setting-up for the treatment of chest injuries and has taught me a lot about chest injuries themselves. First a word about setting-up for chest injuries: Those of us (as almost all of us) who have come from large Naval Hospitals, take for granted the items of equipment, the training of nurses and corpsmen that is necessary for the management of chest trauma. It's always available in the big Naval Hospitals. One doesn't have to trouble oneself about such mundane things as chest tubes, tube thoracotomy trays, pleural suction pumps and the various spare parts required. When we came aboard the REPOSE we suddenly found ourselves extremely troubled by these matters. It was partially because the Navy stock tables did not contain adequate materials for the management of chest trauma. There are not adequate pleural suction pumps, there are not adequate kinds of suction tubing, there are not adequate chest tubes in the Federal Stock Catalog. All of this is open-purchase gear and the same thing is true of many of our vascular instruments in the operating room, etc. So our first job on the REPOSE was to come to grips with ourselves on all these items of equipment, and I would like to thank everybody who was so patient with me in particular as I went around time after time needing them about this equipment. I think it paid off because in Operation Utah on the Starlight Peninsula, we did in fact justify our accumulation of chest suction gear when we had 11 patients on chest suction at one time. We had arbitrarily considered that 12 patients at a time might be a good number to be prepared for and this was justified in that one operation when we had 11 patients actively on chest suction at the same time. That was our first experience on the REPOSE and I think we learned a lot from it.

Now going on to some of the clinical experience we've had: I would like to talk from some of the slides that I've made of the chest x-rays of chest trauma cases that have come in. One of the most interesting facets of chest trauma is the management of thoraco-abdominal injuries. We have treated 43 chest injuries on the ship so far. 13 of these were instances of thoraco-abdominal injuries sustained from a missile fragment or fragments that penetrated both the chest and the abdominal cavity. This first lad (slide) is a patient named Kelly who was seen initially at Chu Lai. He had multiple fragmentation wounds that appeared minor. One of the pitfalls that we all have to watch out for is that we feel that without x-ray, without very detailed physical examination, we can look at a patient and tell whether his fragmentation wounds are truly minor or not. They followed this tack in this instance at Chu Lai, and put this boy in the minor debridement area giving him superficial debridement of his wounds under local anesthesia, and no particular investigation or treatment until the following day when this x-ray was taken (slide). The x-ray was taken before laparotomy. He has air under

the right diaphragm and a very cloudy left hemi-thorax. Here is an instance of thoraco-abdominal trauma. One of the fragment wounds went through the left chest, through the left lung, through the diaphragm into the stomach and the liver and it wasn't treated for 24 hours! He was then treated by laparotomy, suture of the stomach, and the next slide shows the x-ray taken the day after the laparotomy. It is true that in minor injuries of the chest one can ignore the chest injury to a large extent. The most conservative thing to do is to debride and close the chest wall wound and put a tube in the pleural cavity to drain off air and blood, that's conservative treatment. A little more radical treatment is to debride the chest wall wound and close it as a sucking wound into the pleural cavity and not put in a chest tube. We have done this successfully several times. We have seen several other instances where a chest tube was not used and difficulty arose. Now this patient's chest looked pretty good the day after surgery, but the next day when he came to the REPOSE he had a very opaque left hemi-thorax indicative of considerable fluid present (slide). It was found necessary to do a thoracentesis, a needle aspiration, and he cleared up considerably. You can almost see the left diaphragm now, there is still some pleural reaction present, but no further treatment was required. Here is an instance where a chest tube was not used on thoraco-abdominal injury, but it turned out pretty well because he was followed reasonably closely and one thoracentesis cared for the problem. Now this is a very dark x-ray (slide), I'm afraid most of you can't see it, but this is a patient named Howard. Howard brings out the interesting fact that on the beach, and on the REPOSE too, the key word in the management of injuries is "resuscitation". Best resuscitation seems to imply: get the IV started, the pouring in of the blood, pour in the colloids, pour in everything you can get into the patient to get him "resuscitated", that is the key-note. Now this is the initial chest x-ray taken on this boy Howard (slide), as you can see if you look closely there is a little bit of pleural reaction right here on the left side. This x-ray was interpreted as showing hemopneumothorax on both sides, and, since it was so interpreted, chest tubes were inserted with great vigor as this next film shows (slide). These tubes are not well placed, they're put in too far, they're too small, and I really believe that the patient didn't need them anyway. Because they thought he had both sides involved with penetrating injuries he was given 7 units of whole blood, one ampule of Mannitol, three ampules of Sodium Bicarbonate, three units of 75 grams of Serum Albumin, three liters of Lactate and one liter of normal saline. He had a frontal craniotomy during which there was very little blood loss. This is the chest x-ray after surgery (slide). Now after surgery this boy was in severe respiratory distress and I submit that there was no reason for this boy to be in severe respiratory distress! He had minimum chest injury to start with and he ends up with an x-ray which is indicative of pulmonary edema. He has congested, suffused lungs on both sides. He has required a tracheostomy and he still wasn't better so now they had to put him on a respirator. Then he got into further trouble. One of the chest tubes has holes a little too far back and he got a pneumothorax which is clearly visible on this film (slide). But finally, when he got under Dr. Mc Fee's good care on the REPOSE and with

the good nursing care we are able to provide, when he was put on a respirator and his fluids were restricted a little bit, this is how his chest x-ray looked only two days later (slide)---very clear, both sides, with all the tubes out. This case demonstrates a recurring problem--that the management of chest injuries is deceptively easy. It's not as easy as it looks! Its difficult to diagnose, its difficult to know where to put the tubes and when to put them and its easy to get into trouble with neglect of tracheo-bronchial toilet and with over-hydration of the patient. Now I don't mean that I've never made these mistakes, because I've made all of them many times and will continue to do so I'm afraid. But one of the objects of a discussion like this is to try to learn.

Here is a patient named Mc Ilroy who had a supracondylar fracture of the femur. He came aboard the REPOSE with a gunshot wound of his leg. He was in good shape so he was sent to x-ray. Down in x-ray, he started to drip blood rather vigorously from his leg wound and went into shock. As a result of this rather frightening episode of shock in x-ray it is possible he was given a little bit too much blood. He got 14 units of blood, was operated on, put into traction and on the intensive care ward, was given five more units of blood and developed severe respiratory distress with bilateral pulmonary edema. (slide) This happened with a central venous pressure of 28cm H2O, which is very high. He was getting blood at the time and he responded very quickly to 1,000cc's of blood removal and the next day his x-ray shows considerable clearing (slide). Here is another instance of severe respiratory distress from over transfusion.

Now the next case is a boy treated for a gunshot wound of the left chest (slide). A tube, as you saw was placed into the left pleural space and he should have gotten better because his hemopneumothorax was evacuated. But he didn't get better, he got worse. He had severe respiratory distress, so he was sent to the REPOSE thinking that we could do "arterial blood gas studies", which unfortunately we can't do, to try to figure out why he was in such respiratory distress. And here was his x-ray (slide). Now he has received 14 units of blood, much albumin, much Mannitol, Sodium Bicarbonate, etc. etc., and he has bilateral pulmonary edema. The next day, after improper management on our part, totally wrong, (we gave him three units of blood, 2 units of Dextran, 2 liters of Lactate) he is infinitely worse. He is on a respirator; he has bilateral pulmonary edema and a few hours later he died. At autopsy, the significant findings were bilateral pulmonary edema. Now apparently in World War II and the Korean War this was referred to as "post traumatic wet lung". Dr. Eiseman says this is due to multiple areas of atelectasis, I am inclined to disagree with his opinion, I think this is due to over-hydration and over transfusion and some neglect of the tracheo-bronchial toilet in the initial phasing of the wound. Anyway, this patient died from an injury which should not have been fatal and ordinarily is not fatal, a gunshot wound penetrating the chest without massive hemorrhage.

The next patient's name is Guillen. This is a patient whose life was saved by Dr. Neugebauer at the station hospital, Da Nang. This boy started out in Chu Lai with a penetration that went through the left chest, through the left

lung, through the 8th thoracic vertebra (making him paraplegic), through the right lung, and out. So he had a through and through wound through both sides of his chest with paraplegia, obviously a very massive injury. He was initially treated with bilateral chest tubes. He bled 7 units of blood from the right chest at Chu Lai. He probably should have been operated on there, but instead was sent by helicopter to the station hospital. He was then transfused with another 14 units of blood. He continued to be poorly resuscitated, still in shock. Finally, he was operated on. They stopped the bleeding, ligated his dural sac from inside the chest and he stabilized, the bleeding stopped. However, the next day when he got to the REPOSE, the same picture bilateral pulmonary congestion, no doubt about it (slide). He is a boy now that has had 54 units of blood with untold amounts of Albumin, Mannitol, Bicarbonate etc. He has bilateral pulmonary edema. He was put on a respirator, his fluids restricted some, good tracheal toilet, and very promptly both lungs cleared up. He did develop one other complication, staphylococcal pneumonia (slide). If you look on the right side you see an early area of fluid level in the superior segment of the right lower lobe. He was now culturing a hemolytic staphylococcus from his trachea. There was no doubt he had developed staphylococcal pneumonia, however, this started to improve with appropriate antibiotic therapy and at the time he left the ship he was doing well.

Our next patient is another one of Dr. Davis's cases who came into the REPOSE with this fracture (slide). He represents, I believe, a little different twist on this "post traumatic wet lung" because some of these cases are probably due to fat embolus. Here is rather a major fracture of the lower tibia and fibula. Here is the chest x-ray shortly afterwards when he suddenly got into severe respiratory distress (slide). Now this patient was not given a massive amount of blood or intravenous fluids because he did not have a lot of bleeding from his fracture. So here is a case of severe respiratory distress, probably on a different basis, but still severe respiratory distress requiring intensive management with positive pressure breathing, intravenous Heparin and alcohol. He cleared up quickly and survived.

Our next case is a boy named Richardson. He had a gunshot wound of the left chest and shoulder with transection of the distal subclavian artery and loss of circulation in the left arm. This emergency was well handled by Chu Lai by a large exposure turning a whole flap of the chest back. Part of the left clavicle was removed and a whole flap of the left chest was turned back to get exposure of the subclavian artery. Now you all recall that the thoracic duct, the large lymph channel from the abdominal viscera and lower extremities, comes up through the chest and enters the circulation at the left subclavian vein, so that any operation in the region of the left shoulder beneath the clavicle may injure the thoracic duct. This patient developed the interesting complication shown on this film (slide) of a chylothorax chyle or lymph fluid in the left chest. The cloudiness of the left chest is all lymph. We put in a chest tube which drained about 4 liters over several days. There is also an air-fluid level in the wound under the pectoral area of the left chest. Fortunately, this resolved spontaneously, without infection. This patient did well simply with tube drainage, but represented an interesting complication.

This is a patient by the name of Davis. Davis came here with a gunshot wound, through and through of the left lung. Now this was a high velocity missile injury and the type of injury some of the people in the Army hospitals have been operating on promptly. We have not found it necessary to operate, but only to put in a chest tube and give meticulous tracheo-bronchial care. This patient shows an interesting sequence of events, Here is the first x-ray (slide). He still has some fluid in the left chest and a lot of reaction in the left lung. A large bore chest tube was placed and he should have done well, but the next day he has no left lung, it disappeared (slide). This is interesting because when we first look at that film, I think, we would all say he filled up full of fluid, he has a massive hemothorax, his chest is full of blood; but actually, that is not the case. After simple tracheal suctioning, simply putting a catheter in the trachea and suctioning out a lot of bloody retained secretion, the patient's left lung cleared up remarkably (slide). No fluid was removed from the left chest between those two films. This shows the importance of good tracheo-bronchial care which we are fortunate to be able to give on our intensive care ward. After 720cc's of fluid was removed by needle aspiration of the chest, his x-ray cleared up well (slide). He still has a large hematoma where the bullet went through, but over a period of time this completely resolved.

Now the next case and the final case is a boy named Lyon who represents one of our decortications. It is not always possible to get the blood well evacuated from the chest after a penetrating injury. It usually is if you put a tube in promptly, if you put in a large bore tube, if you keep the tube open by milking it well, and if you make the patient cough, you will usually get a good result. Occasionally, you get something that looks like this (slide) very poor result several days after chest tubes had been placed. This boy was sent to the ship with this x-ray. We felt that this was very bad and that we should go right ahead and operate on him the same day to evacuate the hemothorax by major thoracotomy. This was an error in judgement on my part without any question. These boys come in from the field, they are dirty, their chests are not clean, there has been no time to scrub up the skin and get the bacteria off, and I'm certain that it is a mistake, except in cases of real emergency to operate so quickly. We did, we got a fairly good result (slide), his chest cleared up fairly nicely, but if you look at the bottom of the left chest, you see two catheters which are draining a small empyema space. The patient got a major staphylococcal wound infection requiring opening of the entire thoracotomy wound and a small empyema at the site of the old chest tubes. This was not too difficult to treat, but it is a very major complication and could have been avoided, I believe, if we had taken our time and operated 4 or 5 days after admission instead of immediately. The final picture shows the lateral view of the same case showing that he is fairly clear. But, he did get a bad complication.

In summary, we've had 43 cases which is not a large series by any means, but I think has taught us some important lessons:

(1) Laborious attention to detail is necessary to equip a hospital for the care of chest trauma.

(2) A wounded patient in respiratory distress after resuscitation may be over-hydrated and over-transfused.

(3) It is rarely necessary to perform an emergency thoracotomy on chest injuries who survive long enough to get to a hospital ship.

(4) Decortication should be delayed for several days after admission to assure good skin hygiene.

(5) To be effective in war wounds, chest tubes must be of large diameter and skillfully placed.

(6) Neglect of tracheo-bronchial toilet is a common failing.

(7) Thoraco-abdominal wounds can usually be managed by a chest tube and laparotomy.

SIX MONTHS EXPERIENCE IN VASCULAR SURGERY ABOARD USS REPOSE (AH16) PRESENTED BY:

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16 JULY 1966

My presentation will necessarily be brief because our experience in vascular cases has been brief. We have had a total of 14 patients and 15 vascular procedures during our brief experience. This corresponds roughly to what has been the vascular experience in World War II and Korea. Specifically, some 1 to 2% of wounded in action cases will involve a vessel of some type either primarily or secondarily from other wounds. We have had one death for a mortality rate of 8% and 2 amputations for an amputation rate of 16%. I think the reason for this high complication rate is the delay from wounding to when we see vascular injuries. By the time we receive them on the ship they generally have been seen once, perhaps twice, then transferred a couple of times, and even though we get a good vascular repair it may be too late to save a limb or a life.

In World War II there were only isolated attempts at vascular repair. This resulted in a 50 to 75% amputation rate. In Korea, by doing primary vascular repair an amputation rate of about 25% was attained. In Viet Nam, I know of no statistics other than a verbal report that I have gotten from the 93rd Evacuation Hospital during my short tour of Viet Nam. They now have about 150 vascular cases; subdivided into popliteal, femoral, aortic, etc. They have an amputation rate of about 10% and this includes popliteal arteries. This, I think, is an outstanding record from this hospital, about 10 miles SE of Bien Hoa, which is about 40 miles NE of Saigon.

I'll go through our small series of cases. A left radial artery was severed 2 centimeters distal to the bifurcation of the brachial artery. This was capable of being anastomosed primarily utilizing the small fine double arm polyethylene suture. This remained open. Many people would have ligated this artery being as small as it is, but in 1 to 2% of people the ulnar artery will not support the circulation of the hand. Even though, in a small artery such as this you can expect it to clot later on, one should make the attempt to do the repair because this will give the collateral circulation necessary time to develop, saving the extremity. There have been two severed axillary arteries: one required a resection and a vein graft; the second, an end to end anastomosis - both remained open. I do not think these arms were in danger of being lost because they were viable at the time of surgery. However, a viable extremity and a usable extremity may be two different things. You may be able to save an extremity, particularly a hand or a foot, but once a person starts to use it, it may be incapable of usefulness. By just trying to write a

letter the arm may become ischemic to the point that the pain keeps one from doing any useful work. There was a lacerated left brachial artery which required a vein patch graft. This remained open. There have been two lacerations of the right common iliac vein. Perhaps, prior to this particular conflict this vein might have been ligated with a subsequent saving of life, but certainly with some degree of swelling of the limb. Anyway, these were repaired primarily and they remained open.

One of the patients who had two separate procedures was a man we received from Chu Lai after two previous procedures. A right superficial femoral artery which had a flap of edema elevated with dissection. This had caused, due to the delay, clotting of the small vessels all the way down to the ankle and the limb had demarkated above the knee. There was no question that he needed an A/K amputation at the time he came in. We explored him, did an endarterectomy of the right superficial femoral artery and then extracted the clots. From the anterior and posterior tibial arteries we did a vein patch of the popliteal artery and trifurcation down to and including the posterior tibial artery. This converted him, I think, from an A/K to a B/K amputation. He also had complete clotting of the deep venous circulation and had no superficial saphenous circulation, but about 2 or 3 days later he demarkated below the knee and received a B/K amputation and a primary prosthetic placement by Dr. Davis. I think we did him a service by our rather extensive vascular procedure.

In another case we did a thrombectomy of the popliteal artery and trifurcation with a vein patch graft. The leg was viable at the time he was evacuated but when he got to Clark, I understand he was immediately operated on and an A/K amputation was done. This was done in the presence of pulses at the ankle and we don't know what their thinking was, of course. But a severed posterior tibial artery immediately distal to the take off of the anterior tibial artery was repaired with a vein graft bypass from the proximal popliteal artery to the posterior tibial artery. The foot remained viable.

Now the one patient whom I want to discuss a little more is our one fatality. This was a man upon whom a 2½ ton truck fell while working on it. He received extensive blunt trauma to the abdomen and to the pelvis. He came in with a dislocated right hip and pulseless right extremity. As I recall, he had been seen at Phu Bai and then at Charlie Med. So it was probably, at least, a 3 or 4 hour delay prior to the time we saw him and it was another 1 or 2 hours prior to his surgery. The extremity was cold, but it was not blue. At the time of the laparotomy, his right common iliac artery had an intimal laceration with dissection and with complete occlusion of the right common iliac artery. It required a Dacron graft replacement which remained patent until he died. What I failed to recognize in the post operative period was the fact that his right leg was dead.



The period of ischemia was at least 6 hours and could have been 8 hours of total ischemia. Even during the period before his kidney shutdown his leg was swollen, but you expect this after reestablishment of circulation. It is very difficult to assume you have a dead leg with nice pulses present. I think, in retrospect, if a similar case comes in I will immediately perfuse this extremity utilizing the pump we have awaiting surgery. This is our one fatality. He died from a dead leg and other injuries producing kidney shutdown.

SIX MONTHS EXPERIENCE IN NEUROSURGERY ABOARD USS REPOSE (AH16) PRESENTED BY:

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16 JULY 1966

The operative management of cerebral, spinal cord, and peripheral nerve trauma developed during the Second World War still holds true in 1966. Penetrating missile wounds of the brain require minimal but adequate debridement of the scalp and dura. Any muscle involved is debrided vigorously and enough bone is removed to gain adequate exposure for debriding the missile tract in the brain. A craniectomy is usually done, but in certain instances such as high velocity missile wounds of the face and nasal sinuses which also involve the floor of the frontal fossa, it has proved better to turn an osteoplastic frontal flap. It also seems reasonable to turn a flap over the terminus of the tract which extends into the opposite hemisphere or to the opposite pole of one hemisphere for purposes of debriding this part of the tract. If there is a wound of exit this is enlarged as a craniectomy. The dura is always closed water tight and this usually requires a dural graft. A graft taken from the patient at the time of the procedure i. e. temporalis fascia, occipital pericranium or fascia lata is preferable to freeze dried dura graft or plastic dura substitute. A scalp flap is turned over the craniectomy when possible to facilitate the eventual cranioplasty.

Head injuries should be operated as soon as adequate resuscitation and a thorough evaluation have been made. All patients are given antibiotics for two weeks and placed on Dilantin.

Spinal cord injuries are decompressed as soon as possible. However, many of these patients have associated chest and abdominal wounds and it is mandatory that the patient be stable and able to tolerate a laminectomy before he is subjected to it. In other words, the patient's life must be saved before his legs can be saved. Dura is closed water tight when possible but when the cord is swollen and contused it is left open for decompression. Crutchfield tongs and Stryker frames are utilized when indicated.

Wounds associated with peripheral nerve injuries are debrided, left open, and a delayed primary closure done 4-5 days later. In cases where re-exploration is indicated, the nerve is explored and indicated surgery performed three weeks after the initial injury.

The REPOSE is well equipped to care for any type of neurosurgical case. Patients are seen first in triage and, if in no acute distress, sent to x-ray. After satisfactory films are obtained the patient is taken to the recovery room where the scalp is shaved and the patient prepared for the O.R. Post operatively, the patient is returned to the recovery room until

he stabilizes and from there taken to the ICU or the neurosurgery ward depending upon his condition. Patients with head injuries are kept on the REPOSE until they are judged capable of going without medical or nursing care for at least 4-5 days with the thought that they will go from the REPOSE to a hospital in CONUS without being detained in the Philippines or Japan. In practice this has not always worked out, for a few cases have required further hospitalization in the Philippines.

All head injury patients are studied with the echoencephalograph. Our unit is able to do only the "A" scan, or midline localization. An objective study has been set up in an effort to determine the efficiency of the echoencephalogram in the evaluation of acute head injuries; to date this has added nothing of value to the management of the patient. It is my opinion, that under the circumstances of our present mission, the echoencephalogram is of no value to the neurosurgical service.

The EEG machine has been an important tool in the workup of the many neurological consultations received by the neurosurgery department. All post operative head injuries are studied so that early post-injury EEG's will be available for comparison should a long term follow-up study be done in the future.

During the first six months several interesting observations were made in a series of patients undergoing surgery for penetrating missile wounds of the head. Cerebral edema was a problem in only a small percentage of patients, specifically, those in which a major cerebral artery was involved. In most instances the brain decompresses itself through the entrance or exit wounds. The brain which decompresses has been injured by the missile and after the tract is debrided the remaining brain is essentially normal and not subject to edema formation providing its blood supply is intact.

All indriven bone fragments removed from the brain have been cultured, and in only a few cases have the cultures been positive. In each positive culture the wound had been incurred at least 24 hours prior to surgery. These negative cultures indicate that bone fragments in and of themselves may not be the etiology of brain abscesses following penetrating missile wounds of the brain, a theory which is widely believed among neurosurgeons. This observation suggests that bone fragments, which are presumably sterile until the moment of impact, are not, in and of themselves the source of abscesses. Two other possibilities are to be considered. The presence of retained bone fragments is indicative of the care with which the wound was debrided. A surgeon who leaves bone fragments in the missile tract is very likely leaving other debris such as hair and dirt and may not close the dura in a water tight fashion. Another possibility is that the formation of an abscess is related to the time which elapses between wounding and definitive surgical treatment. Head injuries are certainly being seen much sooner by neurosurgeons in this war than in preceding wars.

On several occasions peripheral nerves which were expected to be divided were only severely compressed by surrounding scar tissue. In each case, complete loss of function had persisted for 3 weeks following initial wounding, and in each case there was a rapid and early improvement in function.

Through June 1966, 36 craniectomies, craniotomies or scalp flap revisions were done on 25 patients. The post operative mortality rate is 8%. Sixteen patients with penetrating missile wounds of the brain were operated with one death for a post operative mortality rate of 6.2%. Eleven laminectomies were performed on 10 patients with one death for a post operative mortality rate of 10%. Eleven peripheral nerve procedures were done without mortality. There have been five deaths from neurological injuries during this time. Two were pronounced dead in triage, having arrived with fixed, dilated pupils and signs of fatal injury, confirmed by autopsy. Of the three post operative deaths, a cervical cord injury and a blunt injury to the head were found, at autopsy, to have suffered fatal injuries. They survived to the post operative period primarily because of artificial respiration and excellent nursing care. The fifth death was a patient with a penetrating missile wound of the head who probably would have survived but for a mistake in surgical judgement.

The infection rate has been 17%. Fortunately, none of these infections have contributed to a death. This rate is unacceptable by any standards and efforts are being made to improve upon it.

SIX MONTHS EXPERIENCE IN ORTHOPEDICS ABOARD USS REPOSE (AH16) PRESENTED BY:

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16 JULY 1966

The Orthopedic Service on board consists of 2 doctors, 3 nurses, 8 ward corpsman, 2 physical therapy technicians, 2 cast room technicians, 1 sheet metal worker and 1 pipe fitter from the engineering division. The cast room department, besides applying casts also has a secondary duty which you have seen as they start to initiate the traction devices and the "Erector Set building" that we swing from the nearby pipes, overheads and bulkheads. The physical therapy department has given, to date, 4, 924 treatments. So for all the people that we see, the large group of blue pj's running down to the E deck, many are going down to physical therapy department. The physical therapy department has joined with the sheet metal worker and the pipe fitter to perform a very valuable service. They have been able to rig and make a very functional set of movable parallel bars and a tilt table, which has been of help in the amputee ambulation program. As for statistics, we have these too: while at sea there have been 210 orthopedic admissions of which 67 were due to normal Marine attrition between themselves. The other 143 were directly attributed to combat. Of the 413 surgical operative procedures, the orthopedic service has performed 128 on 96 persons.

In orthopedic surgery there appears to be a large number of patients that have the need for multiple surgical procedures, and of this, I'm sure the names of Mike Neeley, Donald Dietrich, James Hudspeth, Peter Conners, Charles Belue, Steve Eilen and John Gonelli, may stir a few memories.

Unfortunately on the orthopedic service in association with Dr. Mc Fee's intensive care, we also carry one of the highest mortality figures and so far we have known of five deaths of primary orthopedic and total body wounds.

We, as the other surgical services, are using these same basic tenets of World War II and Korea, and our casualty figures have not changed proportionally than with those wars. We use major debridement as necessary, closure when possible on the 4th, 5th or 6th days and then most frequently we will be covering all wounds with plaster before evacuation. We have used internal fixation with metal in a very limited number of cases. This was done primarily when the limb might be saved despite massive soft tissue damage. Internal fixation may prevent conversion to an amputation. In conjunction with vascular injuries we will use internal fixation. In the compound wound with the peripheral vascular surgery being performed as it is now, the limb may be salvaged. The aims of the orthopedic service while quite general, are to try and help the seriously injured in life and limb, and we also returned to duty 100 patients of a total of 210.

Concerning our amputee program; we are not here to try and prosthetize every amputee that comes in. So many of our patients have major multiple wounds of general surgical, neurosurgical, or ophthalmological surgical nature that they must stay on board for prolonged periods. During that time if we are able to undertake an advanced prosthetic fitting we will best serve their needs.

What the program consists of is, first, the obvious initial surgical debridement, when possible followed by closure. After the completion of closure in the operating room, HM2 Mc Carthy will then apply a plaster cast followed the next day by the application of a metal pylon. This is the beginning of the patients first prosthesis. Weight bearing is begun the day after surgery. This has progressed up to parallel bar gait on two patients.

As the patient is discharged we try and direct them to Dr. Frank Golbranson at the (NPRL) Navy Prosthetics Research Lab, Naval Hospital, Oakland, California.

Of the two that we have been able to work with, Charles Belue and John Gonelli, both are continuing ambulation on their prostheses.

The problems of the Orthopedic service are of three major types. One is the attempt to find out what the normal blood volume replacement is, and the maintenance in a patient who has had severe trauma and is missing 1, 2, or 3 limbs. The ability to "educate the guess" is becoming strictly empirical.

The second problem is to judge the need for an amputation; when the amputation should best be performed; and I'm not speaking of the initial traumatic partial amputation that comes in from the field, but the secondary amputation or the amputation necessary in vascular surgery. What level to perform the amputation is always a problem. We attempt on board ship to perform amputations as distally as possible to conserve as much of the functioning limb at all times. We may be wrong at this but if we can save a few extra joints which will help some young men walk a little better in society, then it's worth a try.

Our third major problem area, patients with massive injury and secondary complications of septic shock, gram-negative type shock, and of fat-embolization in any combination, separate, or the entire group joined together. I hope some of these problems may eventually be solved.

SIX MONTHS EXPERIENCE IN EYE SERVICE ABOARD USS REPOSE (AH-16) PRESENTED BY:

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16 JULY 1966

Let me start by giving you a little rundown on what has transpired on the eye service since we arrived on station, 15 February. Owing to the small local weather disturbance causing a large gastric disturbance, I may not be as well prepared as I might like to be.

On the eye service, we have admitted 125 patients to Ward B-2 but some of them were Dr. Terry's. Most of these people we had, had various localized specific eye problems, many of them problems that you might see anyplace; New York, San Diego, or any population that would be susceptible to the normal eye conditions. Most of these were treated on the ward and most of these went back to duty (as they did in the Korean situation). Most of the serious ones, the really bad cases as Dr. Terry showed you, were on other wards. We had to make rounds all over the hospital, and these cases by and large did not go back to duty because there was truly significant loss of vision or loss of the eye. They had to go back to the states.

We saw about 650 patients. Many of these, in the beginning of the tour, were refractions. Since then, they have gotten an optometrist in Da Nang who is doing most of these refractions, taking some of the load off us. However, I think you all remember when we got two helicopters a day, six fellows in each one, for refractions. We did the refractions in the morning, gave them glasses, and they left on the afternoon helicopter. We were set up to do this. It worked well. It was a good security situation because anytime you needed a few Marines, you could call down to the eye clinic and we could send you whatever you needed. The situation at Da Nang has alleviated this to a certain extent, but we feel that the optical shop is still a big advantage as far as making glasses and I'll tell you why later. We did 59 operative procedures, 34 of these were combat injuries. Usually these were done in association with the other surgeons. We frequently had the situation of somebody working on the legs, somebody working on an arm, and Dr. Terry and I up on the head. As in Korea, a lot of these combat injuries resulted in enucleation. I would have liked it otherwise, and I thought possibly that with some of the techniques that have been developed in the last 10 years, notably corneal transplant, we might be able to salvage a few more of these eyes. Unfortunately, most of the enucleations have already been done by shrapnel and it was just a question of finishing them.

We did 25 elective cases. Some of these were of interest, although many of them were minor. Two of them that were of interest were the retinal detachments. I don't think they did these to any extent in Korea, at least they didn't do a definite procedure. We put the retinas back and sent them on their way for convalescence. The age group here is a little unusual, this is a senile disease really. People in civilian population rarely have these traumatic retina detachments alone, without trouble with the rest of the eye (you occasionally see it in prizefighters), but in this active group out here we did come across a couple pure traumatic detachments with one retinal tear.

We did three cataract procedures and I think that I might get a few questions from people in the states who wonder if it is a good idea to do cataracts out here. There are a lot of servicemen here and not all of them are walking around with weapons. There are a lot of support personnel and these are the ones that we did.

One was a Seabee, an older fellow. They have quite a few older fellows in their group and a lot of them are sedentary. They don't particularly want to go back to the states to have this done and I believe it has worked out very well. I'll see when I get back to Da Nang. One of the cataracts was on a village chief and I think here we can do a lot of good work. We did two transplants, one as you know was Lip, the Vietnamese orphan. The other was a fellow who came in with 3 perforating injuries right through the center of the cornea. We trephined the cornea and put in a preserved transplant. The transplant did well, but we missed one foreign body and this lead to endophthalmitis. The eye was eventually removed, but I hope to be able to do more transplants. We brought 20 pieces of preserved corneal material from the National Eye Bank in Washington and we have only used one to date, but we are still looking for that type of injury. We want to remove as few eyes as possible, and we feel we may be able to save some with this technique.

The optical shop has made approximately 820 pair of glasses. That doesn't mean 820 people because some got two pair. I have been very happy with the shop, it has worked out very well. We almost had too large an optical shop to start with. We pared it down a bit and now it is working really well even though the optometrist at Da Nang has taken some of the work. I feel that this shop is a necessary thing to have because when we have 400 patients aboard, the ones with combat injuries lose their glasses at the time of injury and/or in transit. The other thing is that mobility is one of our strong points and at Chu Lai, for example, they don't have the facility for making the glasses. Generally, our figures have run about the same as in Korea in terms of the number of people we've seen. Possibly we've seen a little different type of thing, but it is about the same.

Facilities and equipment when we started were excellent, we have everything here that they have at Camp Pendleton and more and almost as much as they have at San Diego. We do have some new things that we picked up during the last month or so. One is the dermatome for more plastic work around the eyes. We also picked up some artificial eyes for the Vietnamese. You know that most of the Marines that have an enucleation here are sent back to the states where they have custom made eyes given to them. With the help of Dr. Marking we hope to be able to fit some Vietnamese with suitable artificial eyes too. We also have some material for making scleral lenses and conformers. We hope to get a giant magnet and we'll let you all know when we turn it on because it will pull the dials off watches and the fillings out of your teeth. It's that powerful. We feel it is necessary because of the positioning of some of these metal fragments that we've seen. Our smaller magnets are not enough.

Of cases we've seen, as I say, many have been everyday accidents, little minor injuries and things of that nature. There has been a lot of conjunctivitis and a lot of chalazion, all referable to the dirty condition in Viet Nam on the beach with dust and wind and all that. These, I have thought it best to hospitalize so if you walk on the ward you might find a lot of "nothing" sitting around that you wouldn't see in a civilian hospital. You can't give these fellows a bottle of drops and tell them to stay home from work for 3 days and use the drops and warm soaks. In the first place, they don't have warm soaks. In the second place, they don't even get off the ship before the drops are contaminated. They wind up coming back in a few days. So, what we do is keep them out here for awhile. Sometimes, I don't even treat them with anything, just leave them in a clean atmosphere and this clears them up very quickly.



For the combat injuries, the word has been shrapnel as far as I'm concerned. You can tell exactly what kind of action is going on by whether I'm busy or not. If it is a fire fight, I won't see very much. A bullet kills if it's near the eye. The WIA bullet injuries are torso and extremities. The shrapnel is the one for eyes and this is where we get a fragment in the eye. We've seen very few burns, which is surprising because I expected to see a lot more around the lid and the eye. Actually, there has been only one case and it didn't really damage the eye. He was an interesting case, a Marine that was wounded in the Dominican Republic and has a corneal transplant. This was all written as a big thing, but after the write up, the transplant must have gradually become hazy. He was sent out here and he was burned. They sent him to us and he actually had no problem with his eye at all. They thought that the corneal transplant was a burn to the eye.

One of the things that has been a little disturbing is the homemade bomb the people make in their spare time in Vietnam. The children put together a little toy in a beer can and when this is blown into an eye you get a non-magnetic metallic fragment. This is bad for there is no way of getting them out, the magnet is no good for this. On many of these, I admit I chicken out. I try to get them out as soon as possible and let a "board" of ophthalmologists in the states decide whether to remove the eye or not because it is frequently a seeing eye. You may have what looks to be an almost perfectly healthy eye, but it's got a fragment in there and this can lead to a sympathetic opthalmia and blind both eyes. It is a bad situation but we have 14 days before we have to worry about sympathetic. If I can get them back in that time, then it is better situation if a number of eye surgeons agree to remove an eye with vision. If I can't get them out then I will have to take the eye out here even though it is a seeing eye.

We've had some infectious disease, but nothing like I anticipated. I expected to see Trachoma, but we haven't seen it. I talked to several of the doctors in Vietnam including some up by the 17th parallel, (Pediatricians and all) and they say that it is just not around. Possibly the French and then the early influx of American corpsmen got rid of most of it with sulfonamides. I can't tell you why but it just doesn't seem to be there. We've had some unusual viral keratitis that hasn't been described, one in particular. I talked to the ophthalmologists in Japan and they have several cases we may want to write up. It is very much like an epidemic keratoconjunctivitis that you see in swimming pools and that type of thing. However, it is not wildly infectious, it just lodges in one eye and stays there.

The other types of cases have been the electives: the retinas, the cataracts, the pterygium. Pterygium I try to treat conservatively, because this is a bad area for it. We find they tend to reoccur very quickly due to the hot, dry, dust climate.

Of the most interesting patients we've seen since we've been here (and one of the things I would like to foster more than we have, although there are definite difficulties that we can't get around) have been the "people to people". Probably the ones who need the most eye care in this area are not the combat troops, because they are in pretty good shape, but many Vietnamese

people have an ocular disaster of one sort or another. We don't see the trachoma, but we do see a lot of late complications in childhood disease. These people get a simple foreign body in their eye, something you could either wash out or have somebody pick out for you in the states. Here, it will lodge in the eye, it will stay in there, it will become an abscess and the next thing you know they have a large opaque cornea somewhat the same as Lip. We saw several children on the beach with this and we would like to do more corneal transplants, but the problem is getting the fresh donor material. We haven't been able to get a source as yet. It seems a little strange with all the people getting killed, but you just can't take an eye out of a body as it might be called "Mutilating" the body. A good source of donor material would be helpful.

We see a number of children with late effects. There was one child who will come back to the ship when we get to Da Nang. He has a huge protruding eye and this is just an indication of a childhood disease which has gone on to develop Glaucoma. In a child, the eye will expand with the increased pressure on the inside of the eye and it gets larger and larger until you see an end stage eye that is a horror. A lot of these will have to be removed so we can probably do them a service by doing it. The last category that I think we can help "people to people" is in the area of crossed-eye children (what we call squint). We can't give them any exotic care and training, but we can put them reasonably straight and give them a good cosmetic result. It is not my plan to do too much of this on the ship, but I would like to find some of the doctors or the BAS people to do this on the beach. It is not difficult and I think we can work it out.

I do have a few slides to show you some of the things we've seen. (1) KIME: this represents one kind of an eye injury. This is really a blast effect, in fact this is the type of thing we see when a person sets off non-encased powder. We saw some of this at Camp Pendleton that were accidents and it was mostly powder burns. You can scrub this skin. This is a little deeper than the ones Dr. Terry showed you but you can scrub this with a brush. You will still have blue tattooing over the face, however. Invariably, with a thing of this type, not too far away from the explosion, they don't get their eyes closed and there is all sorts of black material in there, most of it burnt powder. Most of it will wash out leaving just a fine peppering of the cornea. The only thing we can do is put the eye at rest and wait until it all quiets down and at a later date these people may be amendable to corneal transplant if some of the material is in the way. This fellow here, we got good and quiet and sent him back to the states, because he will need a fresh donor material transplant. (2) HARKINS: This would be the other type of eye injury we've seen where the eye is totally destroyed. Here a large fragment went in, I could have brought the fragments up, but it was a piece of casing from the bullet, the size of the end of my thumb. It totally destroyed the eye. The interesting thing here (I'm glad Dr. Terry is around) is that these people frequently get a fractured floor of the orbit at the same time. The floor of the orbit shatters very easily and I swear the best treatment in this is the combined procedure of going through an antrum to push the piece back in place, and through the orbit to lift all the material out of the hole. This was done after he was enucleated. Now, in the terms of nursing care of the enucleation,

I have tight pressure dressings placed on them for five days post operatively. The chance of infection is minimal. It very rarely happens if you irrigate well during the surgery and put the patient on antibiotics. They just don't get infected. However, the tight dressings are frequently very uncomfortable and a nurse might, in a moment of compassion, cut the dressing off. Please don't! I would rather sedate the patient because what will happen if you take that dressing off is that the face blows up like a balloon with edema and it takes forever to get it back down. So it is worth a little bit of misery to have a decent outcome. (3) This is JEFFERY, we've shown him before. He is the fellow who had a fragment go through the cornea. We took out a section of the cornea and put in a transplant. This is preserved transplant material. Unfortunately we didn't get out one piece and he did get an infection inside. We had to remove the eye. The transplant was doing well for awhile. It is a little opaque, but these preserved grafts are always opaque. They are only to get continuity of the globe so that later a clear transplant can be done.

(4) This a Vietnamese contingent which one of the BAS surgeons was kind enough to arrange for me. The little boy on the right, (on your left) with the squint is about 10 years old. Our friend who is in the middle, we all know him (Lip). The girl on the right is 23, according to our information. She weighs about 60 pounds and stands a little taller than Lip. She has neurofibromatosis and she represents one of the cases where the children get the ox-eye effect. Whether this is from the neurofibroma or some other disease, we are not sure. She was enucleated and we hope to give her a glass eye when we get back.

That is about all I have to tell you. We expect to do a lot more work when we get back and I am very pleased with everything that has gone on so far.

SIX MONTHS EXPERIENCE IN UROLOGY ABOARD USS REPOSE (AH-16)  
PRESENTED BY:

LCDR O. W. CHENAULT MC USN  
HEAD, UROLOGY BRANCH  
16 JULY 1966

During our 71 days on station the urological side of the house had 138 admissions constituting 9.2% of our total admissions. We saw 365 outpatients which if translated into true Reposean terminology constitutes about "Half a Hoefle".

95% of our patients returned to full duty and our average hospitalization has been 18 days.

INJURIES: The number of injuries encountered has been relatively few, 14 in all. Of these, 3 have been renal injuries. One necessitated a nephrectomy and two received partial nephrectomies. Ureteral injuries being extremely rare have not been encountered as yet on the Repose. There has been one bladder and one urethral injury. The remaining injuries were of the external genitalia, several of which were in our bilateral amputees.

STONES: Reviewing the admission statistics I find that over 1/3 of all the urology admissions or about 3% of our total hospital admissions were for calculus disease. The majority of these stones were small, non surgical and were opaque. Only a few of the patients had any previous history or family history of urolithiasis. Stone analyses have returned as calcium oxalate in 6 cases. There must be a multiplicity of factors at play including dehydration, chronic diarrhea, dietary deficiencies, of trace elements such as magnesium, plus whatever unknown factors there are yet to be discovered; in any event this seems to represent an excessive incidence and is responsible for a considerable loss of manpower. For this reason I would like to suggest an epidemiological and research study to the Bureau.

The remaining patients have been the more or less standard variety of urological practice one would see anywhere in this age group. In closing, I would like to remind everyone of our motto: Victory through pee power.

SIX MONTHS EXPERIENCE IN RADIOLOGY ABOARD USS REPOSE (AH16) PRESENTED BY:

LCDR R. J. ROBL MC USN  
HEAD, RADIOLOGY DEPARTMENT  
16 JULY 1966

The Radiology Department is probably the most fortunate department on the ship. We have the best equipment, all new and functioning, the best technicians, all fully trained and with past experience, and had practically all of our supplies onboard at the start of the cruise.

A compilation of the statistics is herewith enclosed and I would like to cite a few of the more important numbers.

Since January 1st, (although the department was functioning before that date), we have taken 1,775 chest films. It is our policy to get admission chest films on all patients. We had 121 skull films. There were 160 patients with X-ray examinations of two major areas of the body (excluding the chest), 77 patients with exams of three major areas, and 61 patients with examinations of four or more major areas of the body. Most of these patients had multiple shrapnel wounds which we have seen so often.

Special examinations are as follows:

Upper G. I. Series - 144 - At the present we are attempting to make a study of this small group to see what percentage of these were positive. It is roughly about thirty percent, or about twice as high as the average large hospital.

Barium Enemas - 50  
Gall Bladders - 29  
Small Bowel Studies - 8  
Barium Swallow of the esophagus - 8  
Cardiac Series - 2  
IVP - 3  
Retrograde urogram - 4  
Myelogram - 2  
Bone Survey - 2  
Angiogram - 1 (Done portable in the OR)  
Inferior Vena Cava gram - 1  
Pulmonary Angiogram - 1 (Utilizing the arterial catheters and pressure injector we have onboard)

We have done 17 Tomograms which were especially difficult as the apparatus does not work if the ship is rolling more than one or two degrees at the time of exposure. We solved the problem by manually assisting the mechanism. We have done 15 Sweet localizations on intra-ocular foreign bodies.

We have exposed portable films on 228 occasions. The total number of film exposed for radiographs is approximately 9,000.

Some of the positive findings on our films have included: ascariasis of the small intestine and colon, ulcerative colitis, regional enteritis, disordered motor function of the small bowel, parasitemia, gastric ulcer, duodenal ulcer, tracheo-esophageal fistula (traumatic) with chest trauma, disordered swallowing function, metastatic bone disease, bronchiectasis, pneumonia, emphysema, pneumothorax, ingested foreign body, fractures, various mine, missile and blast injuries, and fibromyoma of the skull.

Some of the problems of the department include the inability of obtaining the solutions for the automatic processor necessitating begging, borrowing, and stealing from Clark AFB and Yokosuka Naval Hospital. We still have not received our own shipment of solutions. Minor problems have arisen with the pumps in the processor and these are being attended to at the present time. We are awaiting a new pump.

During a rough sea, the vertical tube support for the overhead X-ray tube in Room #3 fractured and collapsed allowing the tube to strike the deck. This resulted in minor damage to the tube cooling fan and housing and irreparable damage to one of the high voltage cables. Air delivery of the fractured part allowed return of the room to use in less than two weeks.

Tomography is especially difficult while we are underway as the tube carriage does not traverse if the ship is not level or is rolling.

Vibration of the ship is a frustrating problem. We have two major types of vibration, one low frequency vibration that comes in five to ten cycles. This is seen mainly at slow cruising speeds. This causes blurring of the image on the film at relatively low speeds. The other vibration is the constant higher frequency vibration which is present almost always but it is troublesome at high speeds. Most of us have become used to this. It can be made noticeable by placing one's forehead on any bulkhead on the ship. The buzzing or humming sensation gives some trouble with image sharpness.

The first type of vibration can be overcome by exposing the image in the quiet period between two periods of motion. This is a factor not found in any other X-ray facility that I know of.

Movement of wounded stretcher patients has not become a problem although many thought it would be. The only minor problem that has developed is one of patient attendance by the corpsmen when they bring major wound cases from triage. The attending corpsmen should stay with the patients except during the moment of exposure of the radiograph and should all be taught to take vital signs. Also, if possible, triage stretchers should be exchanged for guernsey stretchers as soon as the patient is placed on the X-ray table.

The major problem which has plagued the department from the beginning is the poor quality of film. I understand the film was stored improperly at the depots back in the States and a great deal of it has pressure and temperature fog.

There is no way to get around this problem other than to acquire new film.

Suggestions for improving the department and perhaps making the X-ray department of the Sanctuary more efficient would include the acquisition of a portable Bucky unit. There is such a unit at the U. S. Naval Hospital, Chelsea, Mass. This would improve the quality of the portable films considerably. Consideration should be given to the elimination of the 300 MA fluoroscope in room #1 and replacement with a head unit. This would aid considerably in the examination of the many patients with head injuries, mastoid disease, etc. The fluoroscope in room #1 has never been used for fluoroscopy.

## TOTALS

1-1-66 to 6-30-66

### MULTIPLE EXAMINATIONS

Chest - 1,775  
Fingers - 19  
Hand - 71  
Wrist - 24  
Forearm - 26  
Neck (Soft tissue) - 1  
Elbow - 32  
Humerus - 11  
Shoulder - 29  
Toes - 4  
Foot - 36  
Ankle - 39  
Tibia/Fibula - 38  
Knee - 61  
Femur - 39  
Hips - 15  
Os Calcus - 1  
Pelvis - 6  
Abdomen - 73  
KUB - 9  
Skull - 121  
Facial Series - 7  
Mastoids - 16  
Cervical Spine - 17  
Thoracic - Spine - 39  
Lumbar Spine - 4  
Nasal Bones - 5  
Sinus - 24  
T.M.S. - 4  
Sternum - 1  
Orbits - 2  
Clavicle - 3  
Mandible - 16

2 parts - 160  
3 parts - 77  
4 parts - 61

### SPECIAL EXAMINATIONS

Barium Enema - 50  
Upper GI Series - 144  
Gall Bladder - 29  
Small Bowel - 8  
B-A Swallow - 8  
Cardiac Series - 2  
Intravenous Pyelogram - 3  
(Retro) - 4  
Antigram - 1  
Arteriogram - 1  
Venogram - 1  
Mylogram - 2  
Tomogram - 17  
Bone Survey - 2  
Sweets Localization - 15

Portable - 228  
Upper G. I. Series  
Positive - 7  
Negative - 79  
N. I. F. - 58

### FILMS:

January - 161  
February - 1,267  
March - 1,277  
April - 2,191  
May - 2,508  
June - 1,132

TOTAL FILMS: 8,536

## JANUARY 1966

Chest - 52  
Hand - 6  
Facial - 4  
Skull - 1  
Elbow - 2  
Os Calcus - 1  
Ankle - 3  
Foot - 1

Mandible - 1  
Knee - 3  
Hips - 2  
Lumbar Spine - 3

### MULTIPLE EXAMINATIONS

3 parts - 1

### SPECIAL EXAMINATIONS

Intravenous Pyelogram - 1  
Barium Enema - 4  
Upper G. I. Series - 1



FEBRUARY 1966

Chest - 307

Hands - 8

Wrist - 2

Forearm - 2

Elbow - 1

Humerus - 2

Toes - 1

Foot - 1

Ankle - 5

Lower Leg - 3

Knee - 2

Femur - 1

Skull - 4

Facial Series -

Mastoids - 2

Shoulder - 1

Nasal bones - 1

Sinus - 1,

Cervicle Spine - 2

Thoracic Spine - 0

Multiple Examinations

2 parts - 47

3 parts - 32

4 parts - 24

SPECIAL EXAMINATIONS

Upper GI Series - 12

Barium Enema - 4

BA Swallow - 1

Gall Bladder Series - 6

Mylogram - 1

I.V.P. Retrograde - 2

Tomogram - 5

MARCH 1966

Chest - 376

Fingers - 5

Hands - 13

Forearm - 6

Elbows - 17

Humerus - 1

Shoulders - 3

Foot - 1

Ankles - 3

Lower Leg - 10

Knees - 15

Femur - 8

Pelvis - 1

Hips - 2

Cervicle Spines - 5

Thoracic Spines - 1

Lumbar Spines - 4

Coccyx - 0

Abdomen - 15

Ribs - 2

KUB - 2

Clavicle - 2

Nasal Bones - 2

Facial Series - 2

Skulls - 23

Mastoids - 1

Sinuses - 7

Waters - 2

TMJ - 1

MULTIPLE EXAMINATIONS

2 parts - 23

3 parts - 10

4 parts - 4

SPECIAL EXAMINATIONS

Small bowel Series - 4

GI Series - 25

Gall Bladder Series - 2

Intravenous Pyelogram -

Barium Enema - 4

BA Swallows - 1

APRIL 1966

Chest - 336  
Fingers - 1  
Hands - 13  
Wrist - 5  
Forearm - 2  
Elbow - 2  
Shoulder - 6  
Foot - 4  
Ankle - 2  
Lower Leg - 7  
Knees - 12  
Femur - 8  
Pelvis - 3  
Cervicle Spine - 3  
Thoracic Spine - 2  
Lumbar Spine - 12  
H.B.D. - 12  
Ribs - 3  
KUB - 2  
Clavicle - 1  
Nasal Bone - 1  
Facial Series - 1  
Skull - 35

Mastoid - 5  
Sinuses - 4  
Mandible - 1

MULTIPLE EXAMINATIONS

2 parts - 32  
3 parts - 13  
4 parts - 4  
5 parts - 4

SPECIAL EXAMINATIONS

GI Series - 38  
Gall Bladder - 5  
Intravenous Pyelogram - 1  
Barium Enema - 14  
BA Swallow - 3  
Tomograms - 2  
Bone Series - 1  
Sweets - 3  
Cardiac Series - 1

MAY 1966

Chest - 520  
Fingers - 7  
Hands - 20  
Wrist - 11  
Forearm - 5  
Elbow - 4  
Humerus - 4  
Shoulder - 11  
Toes - 1  
Foot - 16  
Ankle - 13  
Tibia/Fibula - 9  
Knees - 18  
Femur - 18  
Pelvis - 2  
Hips - 3  
Cervicle Spine - 4  
Thoracic Spine - 0  
LS Spine - 10  
Abdomen - 38  
Ribs - 3  
KUB - 4

Clavicle - 0  
Nasal Bones - 1  
Facial - 2  
Skull - 38  
Mastoids - 8  
Sinus - 5  
Waters - 9  
T. M. Joints - 3  
Sweets Eye Localization - 2

MULTIPLE EXAMINATIONS

2 part - 30  
3 part - 8  
4 part - 18

SPECIAL EXAMINATIONS

Small Bowel - 3  
Upper GI Series - 37  
Gall Bladder - 10  
Barium Enema - 16  
Tomogram - 0  
Myelogram - 0  
Intravenous Pyelogram - 2  
Retrograde - 2  
Venogram - 2

JUNE 1966

Chest - 184  
Fingers - 3  
Neck - 1  
Hand - 12  
Wrist - 6  
Forearm - 11  
Elbow - 6  
Humerus - 4  
Shoulder - 8  
Toes - 2  
Foot - 14  
Ankle - 10  
Tibia/Fibula - 9  
Knees - 11  
Femur - 4  
Hips - 10  
Cervicle Spine - 3  
Thoracic Spine - 1  
LS Spine - 10  
Abdomen - 8  
Ribs - 3  
KUB - 1  
Facial - 2  
Skull - 20  
Mandible - 6  
Sinus - 7  
Waters - 3  
Sternum - 1  
Orbits - 2

MULTIPLE EXAMINATIONS

2 parts - 28  
3 parts - 13  
4 parts - 9

SPECIAL EXAMINATIONS

Upper GI Series - 24  
Gall Bladder - 6  
Barium Enema - 8  
Myelogram - 1  
Angiogram - 1  
BA Swallow - 1  
Arteriogram - 1

SIX MONTHS EXPERIENCE IN GENERAL MEDICINE ABOARD USS REPOSE (AH16)  
PRESENTED BY:

CDR D. V. CHRISTIANSEN MC USN  
CHIEF, MEDICAL SERVICE  
16 JULY 1966

At about the end of the first week on station and following one of our first large groups of wounded in action patients there was a batch of 20 Marines who came aboard, all with the complaint of diarrhea. As they came off the helicopter, barely able to walk into the triage area, Doctor Wilson remarked and I agreed that they were about the sorriest group of walking Marines we had ever seen. There were hollow eyed, unshaven, gaunt, wet, dirty, exhausted and weak appearing men, and they smelled bad. The day after their admission it was noted if I remember correctly, in the plan of the day that we were exceeding our water supply capabilities, which was understandable. Three days later, they all appeared well: their diarrhea had subsided, they were entirely different looking Marines. Studies on these young men were all negative on stools for ova and parasites, and repeated cultures. Their diarrhea cleared completely on only supportive and symptomatic therapy. E Coli was cultured from the water supply obtained from their canteens, indicating fecal contamination. The canteens had been filled from a running stream that "looked clear" and was treated with Halo-zone tablets, which was apparently inadequate. This is about the same story, in a less dramatic degree, on the 71 patients that were discharged with a diagnosis of gastroenteritis. There were 5 cases of amebic dysentery, two of which were proven in our laboratory and three that had positive stools prior to admission. There was one death from amebic dysentery, not credited to the Repose, but he died shortly after air evacuation. We could only conclude that the 71 cases of diarrhea were non-specific or of undetermined etiology. They all subsided on only supportive and symptomatic treatment. There were none of the characteristics of the stool that would indicate a dysentery or inflammatory type disease of the bowel.

I have written down some statistics, observations, and conclusions in regard to our experiences on Medical Service during the period in Viet Nam from the middle of February to the present. The total number of patients admitted was 471, of which 466 have been discharged to date, and the remaining five are ready for duty. Of this number, 422 were returned to duty and 49 (10.4%) were air evacuated. It is estimated that 10 or 12 patients were evacuated, not because of severity of disease or for further treatment, but because their rotation date was due; having been here for 12 months. They would otherwise have been fit for return to duty. So, about 8% were air evacuated for further treatment or because they were considered unfit for duty in Viet Nam. In addition to the death from amebiasis there was one death from malaria and one from heat stroke. Some of the discharge diagnoses were: malaria 72, fever of unknown origin about 30, 42 dermatological disease,

of which there were 18 cellulitis. The cellulitis cases were secondary infections, mostly of the feet and legs which by history originated from insect bites, scratches, or athlete's foot that became secondarily infected. There were 15 cases of fungus disease and a miscellaneous group of 9 others. There were 23 cases discharged with a diagnosis of hookworm. Some of these were incidental and were not the reason for admission to the hospital. There were 21 cases of respiratory disease of which there were 11 with bronchitis, 7 pneumonias and 3 asthma. There were 24 cases of peptic ulcer disease that on the discharge diagnosis were listed as 18 with duodenal ulcer and 6 as peptic ulcer. The duodenal ulcer group were proven by our own GI series studies as having evidence of a duodenal ulcer. The other 6 were based on the history or previous findings of ulcer disease and one had gastric ulcer. Dr. Godlash, will mention, along with the group of fevers, the influenza, dengue type illness and scrub typhus. There were five cases of mononucleosis, 4 arthritis, 3 hepatitis which was less than we expected, 2 diabetes mellitis and 2 myocardial infarctions. We had 69 consultations, 234 electrocardiograms, and our technician accomplished 102 electroencephalograms.

To date, we have had 73 cases of malaria of which 3 were proven to be vivax. There were 41 diagnosed as definitely falciparum, and 29 species unknown. However, by association, and because the 3 with vivax were so distinctly diagnostic under the microscope, we believe that the 29 were probably most all falciparum. We made some attempt at treatment evaluation using primarily 3 drugs, Chloroquine, Daraprim and Quinine. These were generally given according to the dosage schedule: Chloroquine was 1.6 to 1.8 grams of the hydrochloride base given intramuscularly over a 4 day period and usually followed by Chloroquine 500mgm, one tablet daily for 3 days, which is considerably more than the usual amount of drug used. Daraprim was given over a 10 day period, giving one gram (15 grains) TID for 2 days and then .65 grams (10 grains) TID for 8 days. The dosage varied slightly because sometimes they couldn't tolerate, because of toxicity, the 15 grains TID. On Chloroquine alone there were 28 cases treated, with a 50% relapse rate (14 cases). Three cases received Chloroquine and Quinine with one relapse. There were 10 cases given Chloroquine as above followed by Daraprim and Quinine with no relapses. Daraprim and Quinine alone was given to 16 cases with no relapses. Daraprim and Quinine were given for the 15 relapse cases with no further relapses. All cases treated with Daraprim and Quinine showed a satisfactory response and there were no relapses over a period of at least four weeks observation, (41 cases). The 3 cases of vivax were treated with Chloroquine followed by a course of Primaquin. Cases not tabulated are those with variety of treatment prior to admission and several evacuated because of rotation, before completing observation period. Some other general observations were that while there was a high relapse rate with the Chloroquine it was generally effective for the treatment of the acute illness with only 3 cases out of the 28 that failed to respond promptly. It was noted to be less toxic than the Quinine and Daraprim and probably more rapid acting. So it is not a drug we believe should be completely discarded. My own reasoning is that resistance has developed because of widespread

prophylactic use. According to text books, Daraprim is a drug that is more prone to develop resistance than the others, but it has not been used as a prophylactic in the armed forces. It may be hoped that it is not used for prophylaxis because we might encounter more resistance than with Chloroquine. There was moderate toxicity to Quinine noted in one case, it had to be discontinued after 5 days because of hypotension. There has been more anemia in the patients who received Daraprim and Quinine than in those that received Chloroquine alone. Most of the relapses were between one and two weeks after treatment, there being only one case that relapsed after three weeks. There was one case that was readmitted six weeks after discharge from the hospital and on the second admission he had Plasmodium Vivax. What species he had on the first admission we didn't know. However, recently in those that we were unable to determine the species, we have often been giving Primaquin in addition during their convalescent period, just in the event that it might be of the vivax species. We believe that a four week period of observation after treatment is indicated. Our patients, we believe have shown too much debility, too much toxic effect from the drugs and anemia to be fit for duty sooner. There are some that would be fit in 3 weeks, however, we believe to be fit for duty in the combat area in Viet Nam, generally a 4 week period of convalescence after completion of treatment is indicated. The latter half of the cases that we've received have been somewhat less ill and we believe this is primarily related to earlier diagnosis and treatment. There were a much larger number diagnosed and treatment initiated prior to admission in the latter group of patients that we have received. The sickest patients we've received were from Operation Double Eagle; the situation was such that there was no treatment for several days.

We have arrived at some criteria for evaluation of the severity of the disease and perhaps most important is the duration of the illness, untreated. Other items are: impairment of liver and/or renal function, fluid retention, cerebral symptoms and degree of parasitemia.

One piece of equipment used in treatment on several cases should be mentioned. The hypothermia machine is most effective in reducing high temperature, and is quite comfortable for the patient, compared to other usual means of reducing fever.

SIX MONTHS EXPERIENCE IN GENERAL MEDICINE ABOARD USS REPOSE (AH16) PRESENTED BY:

LCDR M. K. GODLASH MC USNR  
16 JULY 1966

The term FUO is rather a misnomer. These people are actually patients with fever. FUO implies a prolonged course which has been worked up in other hospitals then referred here which is certainly not the case. These people have had fever from 1 to 5 days. They have received no definite diagnostic tests on shore.

I went through the records and found 140 cases of people who entered with febrile illnesses. Some of these had specific diagnoses, others did not. 62 people were admitted with Malaria and 41 with the diagnosis of FUO. Others included Dengue, Flu and 12 cases of Infectious Mono, 8 Gastroenteritis, and 6 miscellaneous diagnoses accounted for 11 more. These included such diagnoses as Rheumatic Fever and Meningitis, neither of which turned out to be true. There were 143 diagnoses made. Obviously, some people had more than 1 illness. The final diagnosis was Malaria in 72, Typhus in 5, Infectious Mono in 5, and then we have a broad group of FUO, Dengue, and Influenza in a total of 40 patients. I will explain this later. There were other interesting diagnoses made, including Pericarditis, Erythema Multiform, Isopropyl Alcohol poisoning in one, and Malnutrition in one. If we remove the Malarias from this group that made a total of 71 people whose final diagnosis was FUO, Dengue, Influenza, Typhus, or Rickettsial disease, Infectious Mono and the others.

Going into these people, the average length of the stay for the people not including Malarias was 19 days. This varied from 1 day for a man with Pharyngitis to 55 days for an FUO. We returned 94.4% of the people, not including the Malarias, to duty. That is, 4 of 71 did not return to duty. Only 1 of these was directly related to the febrile illness. That was a Marine with Pneumonia and pleural effusion. The others had non-related diseases. One had a bad knee, one had an ulcer, and one was suspected of hyperthyroidism. Interestingly enough, of the people admitted and discharged with a diagnosis of Malaria, 17 had other admission diagnoses. So 17 cases of Malaria were picked up in the hospital non-suspected on shore, however, 7 people admitted with the diagnosis of Malaria to the hospital were found to have other illnesses, not Malaria. Pragmatically, we are doing quite well as shown by the fact that we did return 94.4% of these people to duty. The simple fact is however, in a large number of these cases, we are not quite certain what the illness was that led to the discharge diagnosis of FUO or Fever of Undetermined Origin, or Dengue, Influenza, Typhus, or Rickettsial disease.

In working these people up, we try to find a specific illness such as Pneumonia, Pyelonephritis, or Malaria. Having run through the diagnostic tests we have available, if nothing turns up we then rely on what might be called a therapeutic trial and place these people on Tetracycline. One of the reasons for this inability to get a specific diagnosis is that the constellation of symptoms that these people come in with are frequently the same, primarily headaches, retro-orbital pain, sore throat, muscle aches, fatigue, generalized malaise, and occasionally some abdominal pain. We found the symptoms to be relatively non-specific, being related to Malaria, Viral illness, and Rickettsial diseases. We had 5 people with Typhus or Rickettsial diseases. These people have usually been distinguished by the fact that they have had a rash associated with a small eschar which is typical of the Rickettsial disease. On the basis of this, we have made the clinical diagnosis of Typhus. We have suspected this in a larger group of people than the actual number we have diagnosed. However, in view of the lack of the eschar or some specific finding indicating Rickettsial disease, we have not diagnosed this. I should mention that OXK 19 and OX 2 antigens have been of no value at the present time in diagnosing Rickettsial diseases. We have had only one positive agglutinin and that was on a man who we did not think had a Rickettsial disease.

Having worked these people up, we find 3 general specific groups. In one we find a specific illness such as Malaria, Pyelonephritis, Pneumonia, or Pericarditis. In the second group we have no positive findings, however, we place these people on Tetracycline and found out within 48 hours to 72 hours that we have found some evidence of improvement in the subjective symptoms. In this group of people, I think, we have felt that this most likely is a Rickettsial disease or a large Virus such as the Eaton Agent Virus. This is the group that we have placed in the Typhus or Rickettsial disease unknown category. A third group does not respond to Tetracycline. We feel that this is most likely the Dengue or the Viral illnesses. These people run a prolonged course of about 14 days of fever at which time there is a gradual decline of fever, not a sudden cessation, but each day the temperature spikes a little lower until after 4 or 5 days they become afebrile. Along with the onset of decrease in temperature there is a noted subjective improvement in their symptoms. During the 14 days they usually prefer to lie in bed with minimal activity, but as the fever declines they suddenly note a gradual desire to eat and ambulate.

As I mentioned before the febrile agglutinins do not have or seem to have been of any value, although I believe that we should continue to do them in case we do pick up any which do give us a positive test.

An interesting point is that we have had 5 Infectious Mono cases. This seems to be a favorite diagnosis on shore, having been diagnosed in 10 people, 5 of whom had the disease and 5 who did not.

I think there isn't really much more to say about these illnesses, they run as I said into 3 general categories. We have not seen any Typhoid Fever or any of the other bacterial infectious diseases. I would anticipate that we will continue to get the same type of patient on our return there.



In the rainy season, we may find a few more Malarias, a few more of the diarrhea and febrile illnesses, than we have had up until now. I think our basic plans for the future are still the same. Continue trying to find a specific agent, if we are unable to do that, we will put them on Tetracycline and see what happens over the course of their illness. I think this a legitimate way of doing it as we have exhausted out diagnostic steps and it is not a shotgun form of treatment. The only hope I would have for the next ship that comes out is that someone will have more clinical training before they arrive in the treatment of tropical disease rather than getting on the job training, such as we have had.

SIX MONTHS EXPERIENCE IN THE LABORATORY DEPARTMENT USS REPOSE (AH-16) PRESENTED BY:

F. H. TILOCK LCDR MC USN  
HEAD, LABORATORY BRANCH  
16 JULY 1966

Laboratory Service:

The first part of our cruise was spent in establishing the procedures we would use. These required reviewing large numbers of procedures and finding the one which came closest to matching the reagents we had aboard. As requested equipment and reagents became available more modern and precise procedures were initiated. The following will be a review by section of the work we have done; and some observation on this work.

Hematology:

During the 6 month period, 8,012 procedures were performed. Of this, nearly 3,000 were hematocrits and 2,200 were WBC's with differentials. Eosinophilia has been the most common abnormality. In 1,102 consecutive differentials in April and May, 154 (or 14%) had 10% or more Eosinophiles. This is probably a reflection of the parasitemias our patients have. We did 35 sedimentation rates. This is an easy procedure, however, the results obtained have little or no clinical significance, but directly reflect the amount of vibration and motion the ship has when the tube is set up. 50% of our 2 Sickie Cell Preparations were positive.

Chemistry:

2,697 procedures were performed. The test most frequently performed was the serum bilirubin. Then, in decreasing frequency: glucose, SGOT, BUN, Electrolytes and Alkaline Phosphate. This is rather different than in the usual general hospital. These liver function tests reflect both the value of following Falciparum malaria cases with these tests and the high frequency of jaundice in patients with severe injuries. Electrolytes have not been as frequent as I would have predicted with the number of seriously injured.

The jaundice which appears so frequently in patients with massive injury has been a clinical problem. It is usually characterized by an elevation of both conjugated and non-conjugated bilirubin. They have bilirubiuria and a somewhat elevated urobilinogen. There are several sources for this bilirubin. Some is from the breakdown of RBC's in soft tissue hemorrhage about wounds, some is from myoglobin from deviated muscle and a fair share is from the sequestration and breakdown of transfused old or damaged RBC's. No doubt pressure infusions, and massive transfusion of blood near the end of its banking life add to the problem. We are planning to add serum Lipase and Lactic Acid levels to our procedure soon. These are both difficult and time consuming tests, so their use will have to be on a selected and controlled basis. We also hope to add blood PH, PCO2, and PO2 at some time in the future. These tests will assist us in evaluating the severe respiratory difficulties that are so common and often fatal in the severely wounded.

### Microbiology:

Almost 5,000 procedures have been done in this section. In a consecutive series of 148 cultures taken from wounds, we isolated the following organisms:

Staph Aureus 24%  
No growth 21%  
E Coli 19%  
Staph epiderm 11%  
A. Cloacae 11%  
Pseudo aero 6%  
B Strep 3%  
Prot 2%  
Paracolon 2%  
Alk Fec 1%

We did cultures on 69 urethral discharges with the following isolations:

Staph a 44%  
Staph b 29%  
No growth 24%  
Microyeo strep 2-3%  
Enterococcus 2-3%  
E Coli 2-3%  
No growth 2-3%  
C albicans 2-3%

We did 8 darkfields with one being positive.

### Parasitology:

We examined 586 stool samples of which 69 or 11.6% were positive for hookworm ova. Also found were 2 E. histolyticas, 1 E. coli, 1 ameoba butschlii. Swabs taken at proctoscopic examination were the best way to recover H. histolyticas.

### Urine:

1,681 R&M's, 242 Stool Guiacs and 22 Urobilinogens.

### Serology:

This section performed 980 tests. 8 of 719 VDRL were positive for (1.11%), 11 of 104 Mono were positive for (10.6%), and 2 of 30 Cold agglutinins were positive for (6.7%).

### Malaria:

During this 6 month period, 3,294 slides were examined. From these, 46 patients were positive for a return of 1.4%. Of the thin smears examined, 124 of 1,609 were positive (7.7%).

There were 970 sets of thick and thin smears examined. Of these, 40 (4.15%) thick and 45 (4.7%) thin were positive. In 2 cases the thick smear was positive and thin negative. 5 cases were positive on thin and negative on thick. From this data I feel that examination of thick smears has been unrewarding as only 0.2% more positive were detected by using both smears as against only thin smears. Thick smears are of value in species identification and follow-up on patient with *P. vivax* malaria, but not for *falciparum* malaria. FA studies were also performed on malaria patients. When using positive serum against unknown blood smears which also had Giemsa stained examinations, 86 of 515 were FA positive. Of these 86, only 1 was Giemsa negative, suggesting an excellent correlation with the Giemsa stain. The next step is studying the patients serum against positive smears and comparing this with the Giemsa stain studies. In 46 patients there were 2 with *Vivax* (4.35%), the remainder being *P. falciparum*.

#### Anatomical Pathology:

In 6 months, 236 surgical specimens were grossed of which 1/3 were from other facilities. 2 active duty patients had malignancies. One was a basal cell carcinoma of skin and the other a squamous cell carcinoma of the lip.

#### Autopsy Service:

11 of 17 deaths were autopsied for a percent of 65. Of these autopsied, 8 died of wounds, 2 were non-battle injuries and one medical. Of this group, 5 died of respiratory failure from fat embolization or pulmonary edema and hemorrhage complicating their injuries. 4 died of central nervous system injuries or of pulmonary infection complicating brain or spinal cord damage. 1 died of pulmonary emboli. 1 died of internal hemorrhage after being hit by a truck.

#### Blood Bank:

This section has carried a large share of the work load. It has found the work load to be very uneven, tending to come in spurts requiring maximum effort by all hands. In this 6 month period we have performed 1,689 crossmatches with 892 units actually administered for a utilization rate of 52.8%. We average 90-100 units given per week while in the combat zone. During this time we have had 7 reported reactions, (all but one with negative immunohematological work up) which were characterized by fever or allergic symptoms for a rate of 0.8%. Of 6 patients who received over 50 units of blood, 2 survived. Others may, of course, have received more from other sources prior to or after leaving the ship. One patient received 101 units all together but did not survive.

The lack of accurate data concerning typing, and units crossmatched are given prior to determining the actual blood type.

The blood used has come from 3 major sources; the 406th Med Lab, those we bleed and the Frozen Blood Program.

ACD Blood. 1,833 units of ACD were received mostly from 406 Army Medical Laboratory. 410 were drawn by the ship of which 135 were from our crew. About 25% have donated.

Our transfusion policy has been to use type specific blood at all times and RH specific as much as possible. Some of our problems have been:

1. Lack of transfusion history on patients received aboard.
2. Having excessive amounts or inadequate blood stocks which is often precipitated by unexpected changes in the ships operation and the 4-5 day period between ordering and delivery.
3. Shortage of fresh ACD blood (under 3 days). This is a very useful therapeutic weapon to stop oozing from wounds. However, the only reliable source is volunteer donors from the ship, where there are only so many of a type from which to draw.

#### Frozen Blood:

This is a new and relatively untried product. From our experience aboard the ship we have found it useful for 3 rather specific conditions:

1. Replacement of RBC mass.
2. To extend a limited ACD supply.
3. Problem cases: These are usually type A patients who have been given large amounts of O blood. The O units have large amounts of anti A and soon lyse the patients cells. Frozen O cells, being free of plasma, prevent further hemolysis when transfused and thus allow more rapid return of the patients cells.

SIX MONTHS EXPERIENCE IN NEUROPSYCHIATRY ABOARD USS REPOSE (AH16)  
PRESENTED BY:

LCDR R. E. STRANGE MC USN  
HEAD, NEUROPSYCHIATRIC BRANCH  
16 JULY 1966

Between the time we arrived on station about 15 February and the time we left, in early June, the psychiatric service had had a total of exactly, interesting enough, 100 patients. We also had 15 neurology patients, but I won't go into any detail about them because they were much the run of the mill neurology patients that one would expect in any young adult population. Of the 100 psychiatric patients, 15 were psychotic, 11 had psychoneurotic diagnosis, 37 had character and behavior disorders, 1 had organic disorder, and 36 had transient and situational reactions. This 36 includes the combat fatigues. Of this 100, 58 were returned to duty, for 58% return to duty rate so far. As far as we know our failures are as follows: we had one return to the ship, and we had to evacuate him. He came back after exactly 48 hours in the field; that was a bad decision on my part. We have had two others that we know about who have had psychiatric contact since they were returned to duty. We are constantly trying to follow up on these men, but as you know it is remarkably difficult to do. In my visits with the two psychiatrists who are ashore, one at Chu Lai and one at Da Nang, each reported that he had seen one that had been on this ship and that is all they knew about. This ends up to be about 6 or 7% of the total admissions to the REPOSE. The psychiatrists ashore, one at Chu Lai and one at Da Nang, have lower admission rates; their facilities are not good for admission, but they do admit patients for a few days. They have a much higher number of outpatients. Their work is primarily outpatient and they consequently have a much higher return to duty rate. We think they are having about 75% return to duty, but we are not certain about that. We are pleased with 58% here on the ship, because we get almost all our patients second-hand from the psychiatrists ashore; and almost all of them have had some attempted treatment ashore either on outpatient or inpatient basis. We have been receiving the patients who would normally go to Yokosuka, Guam or some other out-of-country, but in-theater, hospital. The reason for this selection is that these are the patients that might possibly return to duty rather than the ones that are known to be such that they will never be able to come back to Viet Nam. They are sent out here from the beach in the hope that we can give them a little change in environment and a little more intensive therapy under better conditions. Interestingly enough, this is a completely different situation than the psychiatrist on at least one hospital ship in Korea had. I recently talked with one, the Chief of Service at Yokosuka who was on the Haven during the Korean conflict;

he returned nobody to duty. Of course the whole hospital ship, as we know, has a different function really; we are not just furnishing transport now, we are actually a functioning hospital. About 1/3 of the patients that I have received have been situational reactions of one sort or another. There are some classical syndromes. I would say half of that figure, maybe a little more, have been classical combat neurosis and combat fatigue. There are generally considered to be six types of combat fatigue: the anxious type, the depressed type, apathetic, pseudopsychotic, psychosomatic and the hysterical. These are all varieties of combat fatigue, and we've seen a little bit of each. We've seen a lot of anxiety reactions, but the thing we've seen the most of, and the thing that seems to me to be the characteristic psychiatric syndrome for Viet Nam, is depression and headache. This is what everybody seems to get when they have been over here very long.

Now regarding our treatment methods and methods of ward management, we've tried to maintain and have been fairly successful and effective in maintaining a very strongly oriented back to duty attitude on the ward. We have tried to evacuate rapidly those patients that obviously are going to have to be evacuated, mainly psychotics. These, we usually can control in 4 or 5 days actually, then evacuate. We hope to maintain on the ward a majority of patients who are returning to duty. The reason for this is fairly obvious; it is to influence the remainder of the ward population and to prevent hospitalitis, a malignant syndrome that infects all wards, especially on a hospital ship like this where the secondary gain of clean sheets and good chow is so outstanding. We've been having groups each morning at 8 o'clock, as many of you have seen as you come by the passageway. I must admit that because of our rapid turnover, we never get far beyond superficial discussions in groups, and we have a lot of groups that are silent. But we think it is effective and has helped us maintain control of the ward as well as giving some strong social pressure in getting patients back to duty. Incidentally, the corpsmen lead the group every other day, and they do an outstanding job. As a matter of fact, they can sometimes do it better than I, because they don't have the authority problem with which to contend such as I have in the group. No matter what the patient's psychiatric difficulty may be, in the group we rarely get beyond discussion of combat. The reasons for this, I guess are fairly obvious. No matter what the basis of the problem is, the most important problem over here is getting killed and this is what they want to talk about, and what we do talk about. Of course, we hear some stories that are really hair-raising, as you might expect. In our individual sessions with the patients, it has been very much supportive psychotherapy, but I am of the school that finds nothing wrong with superficial supportive psychotherapy. If we can get some superficial insight in the patient that helps him, that is fine. We do a lot of supportive discussion, suggestion, and persuasion. We allow the patient to ventilate and the whole thing is strongly reality oriented. War is here, war is reality and one can not escape from this situation. This is the point that we try to make repeatedly. Regarding medications, we use mainly the

standard psychiatric drugs. We find that almost regardless of symptoms, any acute syndrome including acute agitated depression, anxiety reaction, hysterical episodes and psychosomatic problems, seems to respond symptomatically very well in 48 hours to very heavy medication with Thorazine-and I mean heavy. It would shock many people to see the doses we use for some of these patients, but they are young adult males and need a lot of medication. Frequently after 48 hours we take them off all medications and then start talking to them. Frequently, we don't even start talking until that first part of treatment has been done. This seems to be very helpful. Thorazine, Librium, Valium, Stelazine and Elavil are the ones we found to be most effective and I also use a lot of NA Amytal, especially for nighttime sedation. I mention all these things because our experience so far on this ship has verified them as practical means of treatment.

Now the problems that we've had. We have had several very interesting problems. We have one problem which is not just in our ward, but is certainly common to the whole ship, especially on ambulatory wards. That is the difficulty in keeping the patients busy and occupied. This is a serious problem on a ship like this, and one that has caused me considerable thought. I haven't solved it yet and obviously nobody else has. It is something we should use for future discussion. Incidentally, my main source of consultations are the ambulatory wards because of this problem. Frequently these patients just have too much time to sit around and think, and if one takes an active marine and has him sit and think too long and look at the ocean, he is going to think about his situation, problems and fears, he is going to get anxious. Another problem on our wards, and I have never had this before and it has been a new experience for me, has been a persistent mood of depression and lethargy which is very difficult to combat. We have remarkably little aggressive or anti-social acting-out behavior. We haven't really had any significant incident as far as a patients disciplinary problems. We had one patient who made a very serious threat about jumping over the side of the ship, and we've had a few acute alcoholic episodes in port; but we haven't had much difficulty with agitated behavior. But we have had a depressed ward, and have been unable to solve this problem. The reasons for it are probably obvious. One is that we have a large number of depressed patients; as I mentioned before, this seems to be a characteristic psychiatric syndrome in Viet Nam. Also, there is a remarkable undercurrent of hostility on the ward all the time, again, worse than anyplace else I've ever worked. The reason for this is probably the fact that return to duty is always imminent. Sometimes one gets tired of being "the bad guy", but most of the time we have to be when it means returning patients to duty. This creates some difficulties for the staff, of course, because the staff is frequently attempting to do for the patient exactly what the patient does not want to have done for him; that is, preparing him for return to duty.



This includes even highly motivated marines for nobody goes back into the field without considerable ambivalence about it. Even the patient who says, "I got to go back Doc, I want to go back;" when I say, "OK, tomorrow you are going back," at least preconsciousely he is unhappy. Everyday in our department, and I'm sure in other departments also, an interesting sidelight that has appeared and which we are trying to research a little, seems to be a high psychiatric morbidity among squad leaders. The classic patient on our ward, I think, seems to be a squad leader who is a corporal. This has to do with the terrible burden of responsibility a squad leader has and the fact that he is still in adolescence. He is not like most senior noncommissioned officers and officers who have had a certain degree of adult maturation before taking the responsibility for other men's lives. We suspect there are peaks of psychiatric disability during the 13 month tour in Viet Nam. It seems to us that the bulk of our patients come in after being in Viet Nam for 2 or 3 months or at 10 or 11 months. At 2 or 3 months it appears that the character disorders and immature personalities fold up. This is when they deteriorate and get into trouble after having tolerated it for 2 or 3 months. However, many good marines can make it for 9, 10, or 11 months and then they simply wear out, exhaust their psychological defenses, and begin to have symptoms. Also, there is increasing obsession with impending death. The closer the 13 month rotation date becomes, the more convinced is the individual that he is going to get "zapped." It is frequently not a fear of getting zapped, it is an absolute concrete belief. Some people cannot tolerate this. We are having a large number of corpsmen as psychiatric patients, and it is interesting what causes corpsmen to become anxious. Dealing with death is much less traumatic for the corpsmen than dealing with particular kinds of body injuries which are an assault on their own aspect of body image. Loss of limbs is particularly difficult for corpsmen in the field to tolerate, as well as severe head injuries. We are trying to accumulate some data on this. The most amazing fact is that our experiences on the ship, as well as the experiences of other psychiatrists in Viet Nam, both Navy and Army, indicate that the rate of psychiatric disability is lower in Viet Nam than in any other war in history. It is much lower than anticipated. This has stimulated great psychiatric and military interest concerning to why in this particular conflict is there so little psychiatric problem. The thing that impresses me repeatedly is not the marines I have seen, but the number of marines I have not seen. In World War II, the general statistic was one psychiatric casualty for every 4 wounded in action. In Korea it was better, at least among the marines, and there was one psychiatric casualty for every 8 wounded in action. In Viet Nam I'm speculating it will be about one psychiatric casualty for every 12 to 15 wounded in action. For instance, we have a 58 bed unit here on the ship. Our highest census so far has been 26, and that was an unusual situation. We got 12 patients in one day when they evacuated

"Charlie Med" Our census usually runs around 12 or 15 and has been pretty consistent while on station. Why is this? Why is there lower psychiatric disability in Viet Nam? Nobody knows for sure, but there are ideas. One important aspect is the fact that it is still a limited tour, not like World War II and Korea, when I understand one went overseas and stayed overseas and didn't know when rotation would occur. It is still a 13 month tour for most marines. Until recently, it was primarily a professional's and volunteer's war, although this is no longer true because of the large troop build-up and the draft. There is less prolonged combat or direct confrontation with the enemy, and regardless of the fear and the discomfort of sitting at a guard post all night and the suspense of not knowing when you are going to get "hit", it doesn't seem to be nearly as bad to do that as it does to fight continually day after day. Maybe there is something else too, if you don't mind my editorializing for a moment. I suspect many of this generation of American youth are stronger than some of the foretellers of doom would have us believe. I get the impression that the Marine Corps, at least, has been able to harness the same sort of energy that is going into civil rights demonstrations and that sort of thing. This is a committed generation, and marines over here seem to be genuinely committed to the war. Also, psychiatry has changed. Younger psychiatrists and almost all regular military psychiatrists are acutely aware that psychiatric illness can be iatrogenic, that is, caused by medical attention and treatment. The ability to function must be evaluated separately from reported subjective symptoms. Anxiety is part of life and certainly part of war and is in itself significant only when it significantly impairs function. Freud, himself, said 60 years ago that mental health means, "the ability to love and work." Although the opportunities for loving may be limited in Viet Nam, there certainly is plenty of work to be done. We have learned that encouragement of psychiatric symptoms and tacit approval of retreat from reality is bad, both for the patients and the military. I say this mainly to explain why sometimes people may be shocked with the brevity and the cold-bloodedness of some of my consultations. I think we can too easily encourage illness in a situation like we have here aboard ship, and the most common recommendation that I found I have to make is to get this man back to duty as soon as possible. These have been our experiences so far on the REPOSE.

SIX MONTHS EXPERIENCE IN NURSING ABOARD USS REPOSE (AH-16) PRESENTED BY:

LCDR E. G. WARREN NC USN  
NEUROPSYCHIATRIC NURSE  
16 JULY 1966

Without having a group meeting of all the nurses and obtaining the impressions and ideas of the entire group, the entire area concerning the nursing situation so far cannot be completely covered. Among the things I have discussed with a few of the nurses is the advantage of being able to work together in closer groups. Many of us have worked in hospitals where we moved frequently from service to service, or ward to ward, working with different doctors, different staffs and on unfamiliar wards. Aboard the REPOSE we have been assigned from our first duty to one area and as the new nurses came aboard, they were assigned to an area where they have been stabilized. We have fairly stable ward staffs as well. The corpsmen are assigned to various other areas, they are required to work in compartment cleaning, in the laundry services, and on the mess decks. This disrupts the continuity of nursing care somewhat, but retaining the same nurses, and remainder of the usual ward corpsmen is an asset. With a stable staff and having our ward medical officers close by for consultation, we have been able to create many changes in this ship. The basic purposes of this ship during the Korean War was transporting patients from place to place. During this experience, we have done a great deal of nursing care, surgical procedures and other types of patient care as if we were a large shore hospital. It was fairly obvious when we first came aboard that most of the wards and the areas were not set up for the best care of patients in this manner. One large change was in the Intensive Care Unit where the double racks were taken out and a great deal of remodeling was done. More cabinets were installed and more working space created. Recently, ward C-3, a large surgical ward, has obtained a treatment room that could have been used very well during our previous trips. Ward C-5, Neurosurgery, and C-6, Medicine, have not only been switched, but the surgical layout has been altered considerably. CSR has also been able to create some physical changes. The blood bank, while not in the nursing realm, has been changed considerably.

At first, as we started out, everyone discussed the possibilities of our services, wondering what our experiences would be, what the patients would be like, the number and type of surgical patients we would have and down in psychiatry we weren't sure what we should expect. As time and experience have shown us, we did not anticipate too accurately our needs. We have developed many new procedures with experience and we have been able to physically change the ward situations as the needs appeared.

All the departments had classes during our first trip out from the states. The corpsmen were taught how to work with special equipment, and most of the doctors and nurses had classes in specific types of nursing care, and procedures, in the specialized areas.

One of the things that has been so important is the close association of the ward medical officers with their corpsmen. This is one of the most important things in our ward management; having a ward medical officer who knows his men, who is interested in their progress, willing to demonstrate to them some of the procedures and to show them the value of their observations. During our yard periods, which have come fairly frequently, we have been able to utilize the time by holding more classes, recleaning the wards and improving the organization of the wards. On psychiatry, we have been having weekly staff meetings. Some of the other wards have been doing this also. This has held the corpsmen's interest considerably, by being able to review the patient's conditions weekly and to discuss what is going on in the ward. On some surgical wards the doctors hold small impromptu classes on specific patients. This again, has made some of our corpsmen much better able to give good nursing care and take more interest in their work. At present, we are working on classes for the corpsmen to review the standard procedures. When we have heavy patient loads, some of the standard procedures have been skimmed over. Now we find that our patient load is coming in a more orderly fashion, we are able to keep the charts in better condition, the doctors orders, which previously had to be written very hastily or given verbally, can be written in a more orderly manner.

# MAXILLO-FACIAL INJURIES TREATED ABOARD USS REPOSE (AH-16) PRESENTED BY:

CDR B. C. TERRY DC USN  
JULY 1966

In reviewing our records, I find that we have thus far treated 36 cases of maxillo-facial trauma. These injuries ranged from a simple one pellet 00 buckshot wound of the face to very complex injuries with massive soft tissue destruction and multiple fractures of facial bones. Of these cases 24 or two thirds were a direct result of hostile action. The remaining 12 or one third resulted from such things as being struck in the face by an air hose from a jet starting unit to injuries sustained from "falling out of bed". The first case of facial trauma involved one of our own crew members who fainted following a routine inoculation and fell hitting his face against the deck.

We have returned 50% or 18 of these patients to full duty. For the most part the remaining 18 had other injuries in addition to their facial trauma that required hospitalization and convalescence beyond the 60 day limit afforded aboard the Repose.

86% or 31 of these patients had fractures of facial bones as well as soft tissue damage, ranging from a simple fracture of the mandible to one patient who had a combination of ten different facial fractures.

12 cases or one third of the total were operated under local anesthesia and sedation. Of the other 24 cases requiring general anesthesia, 7 also required tracheotomy in order to adequately repair the maxillo-facial injury and assure an unobstructed airway postoperatively.

As discussed during the program we gave for the Naval Hospital Yokosuka a few days ago, we relied greatly on the advice and experience of those who were engaged in similar duties during World War II and the Korean conflict. Fortunately, the basic concepts of the treatment of maxillo-facial injuries have not changed greatly. We have not added anything new except that with better transportation facilities we are receiving the patient and initiating definite surgical care very soon following the injury. One interesting observation is that once these previously healthy, young patients have been stabilized and resuscitated, multiple surgical procedures can be carried out during the first anesthetic period, many times allowing for complete definitive care of their maxillo-facial injuries. I am firmly convinced that early conservative debridement and closure of facial soft tissue wounds and reduction and fixation of facial fractures alleviate many post-op complications. This also may eliminate the necessity of a second or third general anesthetic for completion of reconstructive surgery.

There is one new observation which we noted that, to my knowledge, has not been reported. This concerns another effect of the high velocity missile. We have seen 3 patients in which a high velocity missile had passed through the face above the roots of the maxillary teeth with no direct dental or oral trauma. Yet in examining these patients we have noted that the crown of one or more of the teeth directly below the missile tracts had been snapped off or sheared off right at the gum line.

Apparently, a shock wave was transmitted through the bone and root causing the crown to separate without any direct trauma. This observation is not of great clinical significance except that when we now see this condition this gives some clue as to the position and direction of the missile and its velocity which may be an important factor in treatment planning.

Now a few words concerning wound debridement. Fortunately the face has such a generous blood supply that we can be very conservative with our soft tissue debridement. Only the very obvious devital tissue is removed. These wounds are washed and scrubbed vigorously to remove all foreign debris possible. This is often a lengthy and time consuming project, but I am convinced it is well worth the effort.

Where possible, we attempt to get primary soft tissue closure. When there has been tissue loss, this may be effected by undermining or the development of rotational flaps. In only one or two cases has it been necessary to leave a portion of the wound open for future skin graft. Naturally all soft tissue surgery is accomplished only after all intra-oral surgery and inter-maxillary fixation devices placed.

As far as I am concerned, all wounds except the most superficial abrasions must be drained. This has been our policy aboard Repose, and we have not had postoperative problems associated with undrained wounds. We have seen hematoma formations and massive infections in patients received aboard Repose in a postoperative status who had their facial wounds closed primarily with inadequate or no drains. Naturally, this makes for unnecessary postoperative complications. We advance and remove the drains in a 24 to 48 hour period.

Debridement of bone fragments is also conservative. Only the completely unattached and those fragments that can be washed free with vigorous irrigation of sterile saline or water are removed. Otherwise all attached bone is molded into position and direct transosseous and intraosseous wiring is used where possible along with intermaxillary fixation devices. All bone is covered by soft tissue with watertight closure. Thus far breakdown of the wounds and subsequent sequestra has not been a problem.

Arch bars ligated to the remaining teeth are our basic intermaxillary fixation device. Along with this we may use a head frame in treating maxillary fractures, external pin fixation devices, and in one case a "K" wire was driven through the face using the uninjured side to support a remaining fragment of zygoma. And as stated previously, direct wire fixation is used along with these other methods.

I have been rather amazed at the lack of postoperative infections in these obviously contaminated wounds. I believe this can be attributed to the following factors:

1. A basically healthy patient pre-injury.
2. Early and adequate debridement of wounds including closure of soft tissue with drains, and reduction and fixation of fractures.

3. Use of massive dosage of antibiotics and good supportive and nursing care.

There was one dramatic and serious post-operative complication in a young man who had sustained massive high velocity missile wounds of the mid-face resulting in bilateral blindness and almost complete destruction of the maxillary zygomatic complex. During his surgery both maxillary antra were packed with iodoform gauze in order to give some facial conformity. On removal of the gauze from the right antrum on the 14th post-operative day, there was a massive hemorrhage with the patient losing 800cc to 1,000cc in a matter of 2 or 3 minutes. This was arrested by repacking the antrum with gauze. Fortunately, the tracheostomy was still in place and we were able to resuscitate the patient. He experienced no additional hemorrhage and the pack was again removed five days later under general anesthesia without difficulty. This is only a warning for those of you who may be removing an antral pack either placed by you or someone else.

(This discussion was continued by showing 35mm slides of injured patients as they initially arrived aboard Repose, scenes during surgery, and the post operative period. All maxilla-facial injuries are being followed with a photographic history as well as clinical records.)

SIX MONTHS EXPERIENCE IN DENTAL SERVICE ABOARD USS REPOSE (AH16) PRESENTED BY:

LCDR G. M. MC WALTER  
DENTAL SERVICE  
16 JULY 1966

I will give a brief resume of the dental service activities. I am excluding Dr. Terry's experiences with traumatic injuries because he has already covered this in his presentation.

The first hour of the day, 0800-0900, is set aside for sick call. Beginning at 0900 until 1630, patients are seen on an appointment basis. This schedule is more or less followed Monday thru Saturday. Sometimes there is a slight problem when at 0900 a scheduled patient arrives along with a couple of sick call types. I should add that inpatients are given priority over ship's company. The main reason being, ship's company personnel have endless opportunity for dental treatment. It is only a matter of their walking down to dental and making an appointment.

I do not know how many dental officers are in the I corps area supporting the Marines, but when I was stationed in Camp Lejune we had about 60 for 40,000 Marines, so I assume there is a similar number ashore over here.

I must average one failed appointment per day, at least. Officers seem to be the main culprits. The failure rate increases when we are in a liberty port. For some reason, there is little interest in dental treatment when it may conflict with liberty.

In 1912 the Naval Dental Corps was established. In the following year, the first dental officer was ordered to a ship, the USS SOLACE. I can safely guess that the dental facilities that greeted that dental officer were no facsimile of what we have on the REPOSE. We have one of the most modern dental facilities afloat in the world. This, I imagine, most of you are already aware of.

Here are some statistics:

Through 30 June we have had 2,568 patients sitting.

6,947 total procedures have been accomplished and of these 2,159 procedures were on inpatients.

In the area of operative dentistry (which is the restoration of lost tooth structures), 2,564 procedures were completed. Here, I have included teeth that have been endodontically treated. This is the branch of dentistry that deals with etiology symptoms and diagnosis of pulp disease, together with periapical sequelae, and the techniques that are used to treat these cases. Unless these teeth are so treated, they must be extracted.



Under prosthetic dentistry, which includes complete denture prosthesis, partial denture prosthesis, and a crown and bridge, 110 procedures have been completed, and I believe that Captain Marking will be aiding Dr. Hoefle in the fabrication of eyes. Also, our dental lab was responsible for the fabrication of 4 bushings for the ship's laundry machine, and for the engineering department, a new strut for the shaft of the motor whaleboat. One could say that we have a very versatile laboratory.

Under oral surgery, 218 operations have been accomplished. Exclusive of Dr. Terry's war wounds. This includes the removal of 105 teeth.

Under periodontics, which is the branch of dentistry devoted to prevention and treatment of diseases of supporting tissues of the teeth, 1,560 procedures have been executed. The majority of these procedures were made up of oral prophylaxis, periodontal scaling and caries prevention treatment. 410 of the latter treatments were accomplished.

Some of you may not be familiar with our free agent Stannous Fluoride cariostatic treatment. In the Navy study at New London it was found that Stannous Fluoride paste prophylaxis, caries in the teeth were reduced by 12% after one year. When this Stannous Fluoride paste was used, plus a 10% application of Stannous Fluoride, the reduction was 47%. When these first 2 agents were used, plus the daily use of a Stannous Fluoride dentifrice, the reduction was 73%.

The two acceptable dentifrices are Crest and Cue. I think most of you are aware of that already. The reason for their use, is that they give a daily supply of Fluorine, to replace those that are lost by the gradual washing away by saliva.

On this ship, any patient who is to walk into the dental spaces and has not received his treatment in the previous year he has been so appointed. Right now we are checking dental records to see who hasn't received his treatment in the last year, and if you haven't you will be treated also.

We have many frequent uses for our camera spot. This is an ultrasonic instrument used for removing calculus and stains from teeth. The insert tip of this instrument moves 25,000 microscopically small mechanical strokes per second. It moves back and forth over a distance of 1/1,000 of an inch. This is a very gentle instrument I might add.

A couple more statistics:

460 roentgenograms have been taken.

1,314 oral examinations have been given, and there have been 653 post operative treatments.

A few closing remarks, I think the number of inpatients who seek dental treatment is a pretty good barometer of their physical condition. If they are brave and strong enough to come down for dental treatment, they should be ready to return to duty.

Finally, I might add, that I consider myself fortunate being associated with two specialists like Captain Marking and Dr. Terry, and I might add a ditto for my feelings toward the rest of the hospital staff.

SIX MONTHS EXPERIENCE IN ANESTHESIOLOGY ABOARD USS REPOSE (AH16) PRESENTED BY:

LT D. W. BILLHARZ MC USN  
ANESTHESIOLOGY BRANCH  
16 JULY 1966

When the anesthesiologist approaches a patient he takes for granted the integrity of the airway. We have encountered thus far several patients with maxillofacial injuries of such a nature as to compromise the airway. These patients have forced us to revise our techniques of establishing an airway for administration of general anesthesia. The experience gained has been of great value to me personally because until now I have had little experience dealing with this sort of problem.

The first slide illustrates moderate facial burns and severe edema. The patient had a history of having recently eaten. It was obvious that placing a mask on this patient's face with sufficient pressure to achieve a tight fit would probably result in damage to the skin. For this reason, as well as the probability of food in the stomach, the patient was intubated awake, orally, with the aid of topical pharyngeal and transtracheal anesthesia.

The second slide illustrates a different kind of airway problem. This patient had shrapnel enter his face laterally and penetrate the maxillary sinus. The wound was debrided and closed primarily before the patient was transferred to the REPOSE. Here he developed intense swelling of his face with painful spasm of the masseter and temporalis muscles. He could open his mouth only one quarter of an inch. One could not safely put this patient asleep until his airway was secured. He was handled with an awake, blind, naso-tracheal intubation, which went unusually well. After the airway was thus secured, anesthesia was then induced.

Progressively moving to more severe facial trauma we come to the next slide which shows a patient who received a round laterally through his mandibular ramus, passing through the base of his tongue severely lacerating it, and lodging in the opposite neck, near the carotid sheath. This patient suffered profuse bleeding within his oral cavity, so much so, in fact, that he could not lie supine easily and preferred the prone position which allowed the blood to drain freely. Such patients occasionally must be intubated blindly in the prone position before they can be turned supine and anesthesia induced safely. This particular patient could be placed supine as long as he could turn frequently and rid himself of the oral accumulations of blood. An awake blind naso-tracheal intubation was attempted several times but failed. Though somewhat more hazardous, he was anesthetized, paralyzed and the nasal tube placed into the trachea under direct vision with the aid of Magill forceps. The pharyngeal structures were seen to be grossly distorted and perhaps this accounted for the failure of the blind intubation. It should be added that in case of fractured mandibles, oral intubation is not a solution because surgical correction requires wiring the jaw shut.

The next slide illustrates again a fractured mandible. The whole anterior portion is shot away. This patient was intubated nasally by the blind technique while awake.

In all cases of fractured mandibles nasal intubation is not necessarily the answer to the airway problem. The patient is carefully evaluated for patency of his nasal passages with a view to forecasting post operative respiratory inadequacy. Tracheostomy is done liberally if it is thought that the patient will breathe adequately post operatively through the nose.

The final slide illustrates a patient whose degree of facial trauma is about maximal. He was wounded with two bullets which passed through both eyes fracturing his nasal and maxillary bones as well as his mandible. One could demonstrate the "floating maxilla" by grasping his upper central incisors and moving them. The whole maxillary structure moved as the teeth moved. Such a patient could not be given a nasal intubation because of the danger of causing hemorrhage or of passing the tube sub-mucosally. The anesthetic mask could not safely be applied to this shattered face. Tracheostomy was the only answer.

All the patients presented here did well. They are by no means all the cases of facial trauma with which we have dealt but they nicely illustrate the range of injuries encountered.

I would like to pass to another subject. During operation Utah I was called upon to anesthetize a patient with abdominal wounds who manifested most unusual behavior during and after anesthesia. The patient was placed on the operating table as blood was being cross matched. His blood pressure was between 70 and 80mm Hg systolic and his pulse was 140 per minute. He was febrile. His extremities were warm and dry. Intra-abdominal hemorrhage was suspected as the cause of the hypotension and tachycardia. Before blood was available 50 grams of albumin and 2000cc's of Lactated Ringer's Solution were given. There was no increase in blood pressure. Then two units of blood were given rapidly with a transient increase in blood pressure to 110 systolic. Blood pressure fell again to the range of 70 to 80mm Hg systolic.

Anesthesia was then induced as more blood was pumped in. By the time the abdomen was opened, five units of blood had been given without any sustained blood pressure response. No intra-abdominal bleeding was discovered. The wounds penetrated the transverse colon and colonic contents were spread throughout the peritoneal cavity. Septic shock was suggested as a cause of the hypotension. At that point, fearful of already having over loaded the patients circulation, I decided to content myself with a blood pressure of 70 to 80mm Hg systolic and to withhold further fluids until venous pressure could be measured adequately post operatively. The patient was started on intravenous antibiotics.

During the first eight hours post operatively the patient's temperature fell gradually from 104° to 99°. His pulse fell from 140 to 84 per minute, and his blood pressure stabilized at 110/70. On questioning the following day the patient gave a history of severe diarrhea and fever prior to being sent into action where he was wounded. He lay all day in the heat before he could be evacuated to us. While we have no direct evidence such as blood culture of gram negative septicemia, it certainly offers a good explanation of this patients course. He did well.

This has been a presentation of only some aspects of our work in the anesthesia department. It has been a real challenge.

SIX MONTHS EXPERIENCE IN ANESTHESIA ABOARD USS REPOSE (AH16)  
PRESENTED BY:

G. A. PLAYFORD LCDR MC USN  
ANESTHESIA BRANCH  
16 JULY 1966

To date we in the anesthesia department have administered about 405 anesthetics in the operating room. Of these, the vast majority have been general anesthetics with a few being axillary blocks, caudals and 24% were spinal.

So far we have had one or two major complications with no deaths we can directly attribute to anesthesia.

In spinal anesthetics we have run a 3% incidence of spinal headaches which is quite acceptable since the national average is about 5%. We have had no current neurological sequelae and no infections in the spinal group and in the general anesthetic group we have had two patients to vomit and aspirate while under the influence of an anesthetic. One of those we were aware of when the incident occurred and that patient was treated and had no detectable post-op sequelae from the aspiration. The other one, we were unaware that it occurred and that patient developed a severe post-op atelectasis which responded to subsequent treatment.

I'd like to make only a couple of comments on our activities outside the operating room itself since it's obviously in the operating room where our major experiences have occurred. Number one is in the triage area. When I first came out, there were a couple of anesthesiologists from the beach who had been out here for awhile who very vehemently recommended that we have an anesthesiologist in the triage area for almost every flight quarters. Obviously we have not done this and we feel that it has worked out quite well not having an anesthesiologist up there. I don't think we have had any untoward complications because we were not in the triage area. Another area as Bill has mentioned, and that is the use of the recovery room as a pre-op staging area for the badly traumatized patient. I also think this has worked out quite well and would like to appeal that the surgeons continue to call the anesthesiologist early for the badly traumatized patient who is obviously going to have a major resuscitative effort and going to require surgery. It is important that we participate in that resuscitation because as soon as that resuscitation is through, that patient is going to be turned over to the anesthesiologist for administration of an anesthetic and then we are going to have the responsibility for him anyway.

In the operating room our major anesthetic has been Fluothane. I suspect by the time we are through with this whole experience in Viet Nam there will be quite a written experience on the use of Fluothane in the traumatized patient which has not been so, so far in the literature. This proved to be a very

good agent. I was a little concerned at first because even in normal individuals, Fluothane is a severe cardiovascular depressive agent. It lowers blood pressure in almost everyone normal or otherwise, and here we are dealing with a great number of hypovolemic patients. So we were a little concerned what the combination of hypovolemia and Fluothane might produce, and indeed it has created some problems. We over and over again see these badly traumatized patients who have been stabilized in the recovery area or pre-staging area, whichever one wants to call it, then we go into the operating room and start the anesthetic and the bottom falls out. This we see over and over again. We have learned to anticipate this and it has caused no great concern or at least we know what to do for it. It is the usual picture to start the anesthetic and have the patient's blood pressure (now I'm talking about the badly traumatized patients, the minimally injured patients and the elective cases have presented no problem) fall to 60mm of Mercury systolic. We do not give vasopressors for this. We do not feel that they have a place in treating this sort of shock. Now there are exceptions which we will get to later but the usual patient coming for his first surgery, we don't give vasopressors to elevate the blood pressure, because the fall in his blood pressure is due to hypovolemia. We administer a very light anesthesia and give intravenous fluids.

We have been evaluating what we think is central venous pressure by inserting a large intracath into one of the external, or if we are lucky, internal jugular veins. Now whether this is true central venous pressure I don't know, because I don't know where that catheter is going, but it is at least an intrathoracic venous pressure where there are no valves in the veins and it does reflect to an extent, central venous pressure. We feel that this is a rather important monitoring device in these patients because there are so many things, by the time we are two thirds of the way through these procedures, there are so many factors influencing what we are trying to measure until the interpretation becomes awfully hard.

How we resuscitate these patients is, in a way haphazard, but in a way we have some system. For example, as Mitchell has mentioned, we give huge quantities of blood, plasmanate, albumin and crystalloids, and to someone using the charts, this all looks indiscriminate at times. I have been following a pattern, to an extent, of the work that was done by Boyan and Howland in New York. They recommend that, in patients receiving huge transfusions (by that I mean more than 15 units of blood) that one alternate approximately 1 liter of crystalloids for every 4 units of blood. We don't follow this to the "T", but to an extent we try to. Also, based on the work of Boyan and Howland, we do not routinely give calcium intravenously to those patients who have had huge blood transfusions. Some people feel that the calcium should be given because it has a stimulating effect on the heart and also because these massive transfusions tend to lower the serum calcium. This was not given, and I don't see any instance where it has caused any real problem. Incidentally, we have had no "cardiac arrests" on the operating

table and we have had only one instance of a severe cardiac arrhythmia and that was in a third operative procedure on a patient, and that patient was severely toxic. I don't think that we are getting into any great problem by not giving calcium to our patients on the operating table. Also, the administration of the bicarbonate, we try to do according to a system in the operating room, and again this is on the work of Boyan and Howland. They feel that one should administer one ampule of bicarbonate, approximately  $44\frac{1}{2}$  meq, for each 5 units of blood. We try to follow this to an extent. There are some other formulae one can use. Despite the fact that this may look like a haphazard type of resuscitative effort, it is not quite that.

In evaluating and determining how much fluid we should give these people, (we have hashed this out many, many times), we do not try to normalize our patients. We don't try to get a normal central venous pressure because it's impossible to decide what's going to be normal for a patient with both his legs destroyed, who is cold from receiving massive transfusions of cold blood, is acidotic because that blood usually is quite old (2 weeks or older), he has had Fluothane which tends to lower his blood pressure, and in many instances has had curare, which also can lower blood pressure, particularly in hypovolemic patients. So, when at the end of a case we have a patient whose blood pressure is 100 systolic and his venous pressure is 5 or 6 mm of water, I am usually quite satisfied. There is something that the wards have seen and will continue to see and that is; frequently when a patient comes back from surgery, you will see his blood pressure begin to trickle off and he will go into shock. This is not a failure on the part of the surgeons and anesthetists to adequately resuscitate those patients. This is simply a sign that the patient was hypovolemic, probably when he left the operating table, or he has lost more fluid, which they will continue to do, but just be aware that these things are going to occur and they are going to continue to occur because we are not trying to completely, totally replace those patient's blood volume in the first sitting. I don't think we should, and in view of the fact that we are beginning to see this problem that Dr. Mills discussed before, this pulmonary edema 3 and 4 days post-op, I think it best we continue to do as we do and that is have the patients leave the table, probably, a little hypovolemic. I can't prove that they are hypovolemic, we don't have such an instrument yet. Perhaps, if we get the Volemetron it will help. I don't know.

As far as warming the blood, we have tried to an extent to do so, but in so many of these patients we are in such a hurry to pump in fluid, that it is impossible to take the time to pump the blood through the blood coils. One of the group likes this blood coil thing. I am not quite so impressed. I have found several little things like too much resistance in the coil trying to get the blood through it. It is just a long coil of plastic that sits in a pan of water. What we have been trying lately, in those patients we know that we are going to see massive transfusions, is to get down 5 or 6 units ahead of time and set them in one big pan of warm water. This has



helped to an extent. I think we are very lucky, as we have said over and over again, to be dealing with patients who were initially quite healthy. I think this has kept us out of a lot of trouble, with the old, cold, acidotic blood that has a high potassium.

One other problem is in the patient who comes back for a second or third procedure. Frequently these patients are as sick, if not sicker than those we get for their first surgery. All too frequently, they are then quite toxic, febrile, and acidotic, and it is not infrequent that they have fat embolizations or actual pulmonary emboli, and still we have to give them anesthesia for the subsequent surgery. You will have these patients also. They will be in many instances, a sicker, harder to handle patient than was the patient with initial surgery.

All in all, I think we have had an excellent experience, anesthesia-wise, on the Repose, and we've proved that Fluothane is a very good agent even in a shocked patient. For a while it was the impression of many people and it is still quite an argument among research anesthetists, as to what is the better agent: Cyclopropane, because it tends to elevate blood pressure, or Fluothane which tends to lower blood pressure. I don't think we can contribute any scientific data to the argument, but we can show them quite a series of patients who have come through quite well despite the fact that they are hypotensive for quite awhile during their surgery under Fluothane.